Colour Television **Chassis**

FM24

AA

Service
Service
Service



Service Manual

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PHILIPS

1. Technical Specifications, Connections and Chassis Overview

1.1 Technical Specifications

1.1.1 Picture

Display	:	FHT plasma panel
Screen size	:	42" (106 cm)
Resolution	:	1024 x 852 pixels
Contrast ratio	:	400 : 1

1.1.2 Sound

Maximum power	:	30 W_{rms}

1.1.3 Miscellaneous

Mains voltage	:	95 - 264 V_{AC}
Mains frequency	:	50/60 Hz
Ambient temperature	:	+ 5 to + 40 deg. C
Maximum humidity	:	90 % R.H.
Power consumption	:	around 400 W
Standby Power consumption	:	< 3 W
Weight	:	40 kg
Dimensions (WxHxD)	:	1215 x 657 x 90 mm

1.2 Connections

1.2.1 Rear Connections

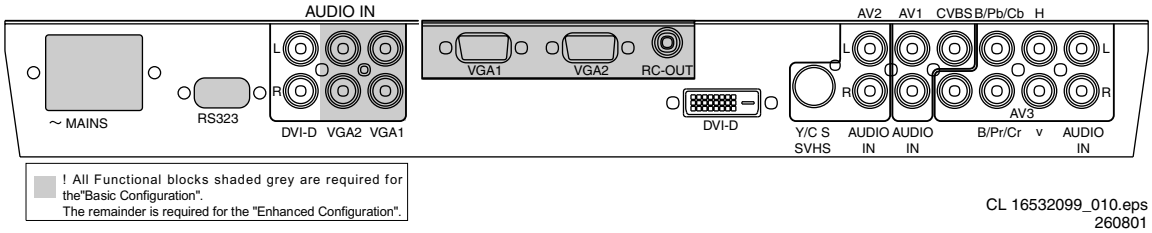


Figure 1-1 Rear Connections

RS232

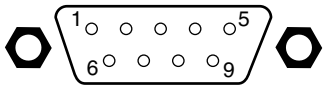


Figure 1-2 RS232 connector (subD-9p)

1 -		
2 - TXD	(UART)	⊖→
3 - RXD	(UART)	→⊕
4 - RL_ICN	(ICONN)	→⊕
5 -	Ground	⏚
6 - GL_ICN	(ICONN)	⊖→
7 - LD_ICN	(ICONN)	⊖→
8 - IR_TX	(ICONN)	⊖→
9 - IR_RX	(ICONN)	→⊕
10 -	Ground	⏚
11 -	Ground	⏚

Audio - In (DVI-D)

1 - Audio - L	0.5 V_{rms} / 1 kΩ	→⊙
2 - Audio - R	0.5 V_{rms} / 1 kΩ	→⊙

Audio - In (VGA2)

1 - Audio - L	0.5 V_{rms} / 1 kΩ	→⊙
2 - Audio - R	0.5 V_{rms} / 1 kΩ	→⊙

Audio - In (VGA1)

1 - Audio - L	0.5 V_{rms} / 1 kΩ	→⊙
2 - Audio - R	0.5 V_{rms} / 1 kΩ	→⊙

VGA1 - In

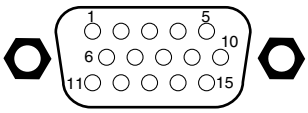


Figure 1-3 VGA Connector

1 - Red	0.7 V_{pp} / 75 Ω	→⊕
2 - Green	0.7 V_{pp} / 75 Ω	→⊕
3 - Blue	0.7 V_{pp} / 75 Ω	→⊕
4 - TXD		⊖→
5 -	Ground	⏚
6 - Red	Ground	⏚
7 - Green	Ground	⏚
8 - Blue	Ground	⏚
9 - RC		⊖→
10 -	Ground	⏚
11 - RXD		→⊕
12 - DDC_SDA		→⊕
13 - H-sync	0 - 5 V	→⊕
14 - V-sync	0 - 5 V	→⊕
15 - DDC_SCL		→⊕

VGA2 - Out

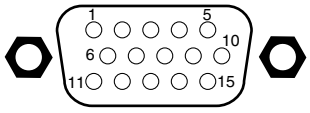


Figure 1-4 VGA Connector

1 - Red	(0.7 V_{pp}/75 Ω)	
2 - Green	(0.7 V_{pp}/75 Ω)	
3 - Blue	(0.7 V_{pp}/75 Ω)	
4 - TXD		
5 -	Ground	
6 - Red	Ground	
7 - Green	Ground	
8 - Blue	Ground	
9 -		
10 -	Ground	
11 - RXD		
12 - DDC_SDA		
13 - H-sync	0 - 5 V	
14 - V-sync	0 - 5 V	
15 - DDC_SCL		

RC - Out

1 - RC

DVI-D

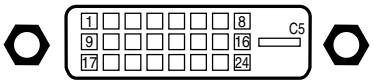


Figure 1-5 DVI-D Connector

1 - RX2-		
2 - RX2+		
3 -	Ground	
4 -		
5 -		
6 - DDC-SCL		
7 - DDC-SDA		
8 -		
9 - RX1-		
10 - RX1+		
11 -	Ground	
12 -		
13 -		
14 - 5V_STBY_SW		
15 -	Ground	
16 - 5V_STBY_SW		
17 - RX0-		
18 - RX0+		
19 -	Ground	
20 -		
21 -	Ground	
22 -		
23 - RXC+		
24 - RXC-		
c5 -	Ground	

AV2: SVHS - In

1 - Y	Ground	
2 - C	Ground	
3 - Y	1 V_{pp} / 75 Ω	
4 - C / 16:9	0.3 V_{pp} / 75 Ω	

AV2: Audio - In

1 - Audio - L	0.5 V_{rms}/10 kΩ	
2 - Audio - R	0.5 V_{rms}/10 kΩ	

AV1: Audio/Video - In

1 - CVBS	1 V_{pp} / 75 Ω	
2 - Audio - L	0.5 V_{rms} / 10 kΩ	
3 - Audio - R	0.5 V_{rms} / 10 kΩ	

AV3: Audio/Video - In

1 - G/Y/Y	0.7 V_{pp} / 75 Ω	
2 - B/Pb/Cb	0.7 V_{pp} / 75 Ω	
3 - R/Pr/Cr	0.7 V_{pp} / 75 Ω	
4 - H		
5 - V		
6 - Audio - L	0.5 V_{rms} / 10 kΩ	
7 - Audio - R	0.5 V_{rms} / 10 kΩ	

1.3 Chassis Overview

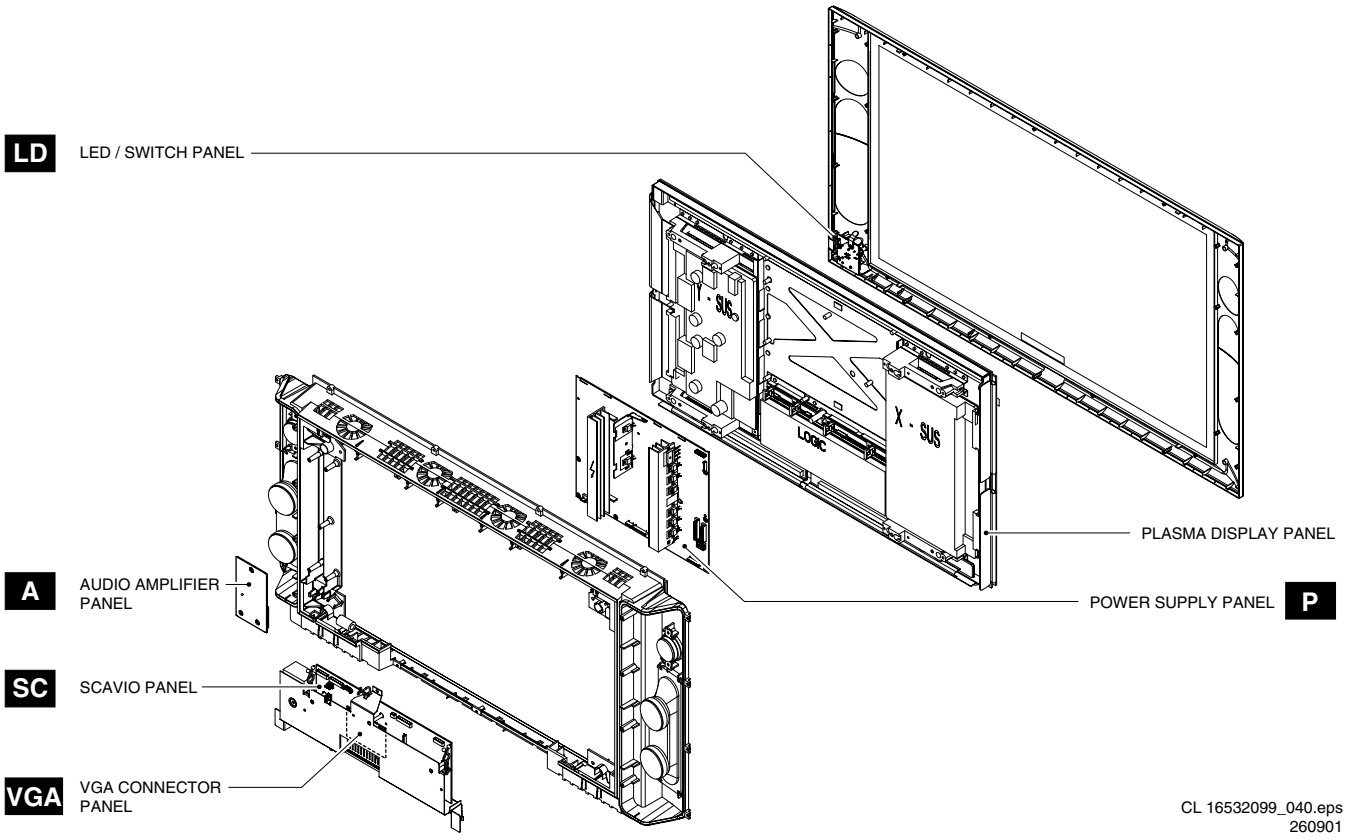


Figure 1-6 PWB Location

2. Safety Instructions, Warnings and Notes

2.1 Safety Instructions

Safety regulations require that **during** a repair:

- Connect the set to the mains via an isolation transformer (= 800 VA).
- Do not operate the monitor without the front glass plate. One function of this glass plate is to absorb IR radiation. Without this glass plate, the level of radiation could damage your eyes.
- Replace safety components, indicated by the symbol ▲, only by components identical to the original ones.

Safety regulations require that **after** a repair, the set must be returned in its original condition. Pay, in particular, attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the mains lead for external damage.
- Check the electrical DC resistance between the mains plug and the secondary side (only for sets which have a mains isolated power supply):
 1. Unplug the mains cord and connect a wire between the two pins of the mains plug.
 2. Set the mains switch to the 'on' position (keep the mains cord unplugged!).
 3. Measure the resistance value between the pins of the mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MΩ and 12 MΩ.
 4. Switch 'off' the set, and remove the wire between the two pins of the mains plug.
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

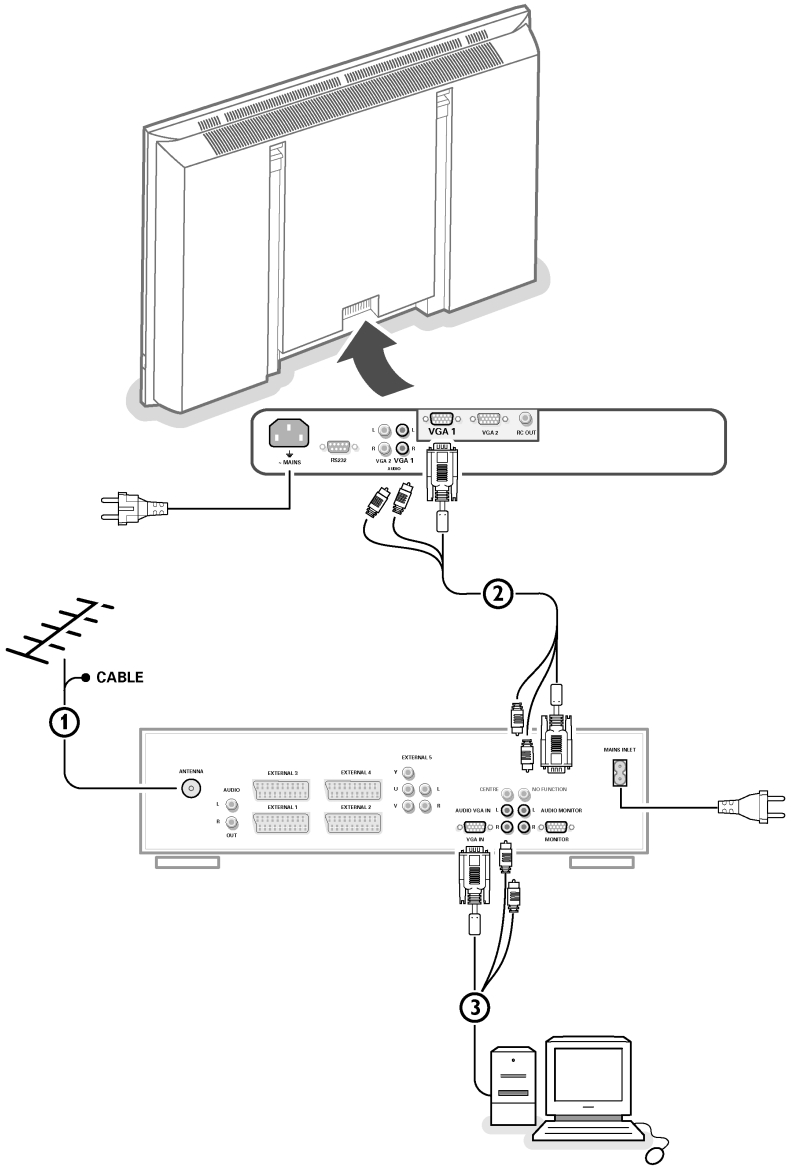
2.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD ⚠). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
 Available ESD protection equipment:
 – Complete kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable) 4822 310 10671.
 – Wristband tester 4822 344 13999.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched 'on'.
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

2.3 Notes

- Clean the glass plate in front of the plasma display with a slightly humid cloth. If, due to circumstances, there is some dirt between the glass plate and the plasma display, this must be cleaned by a qualified service engineer (see chapter 4).
- Measure the direct voltages and oscillograms with regard to the chassis ground (⏚), or hot ground (⏚) as this is called.
- The direct voltages and oscillograms shown in the diagrams are indicative. Measure them in the Service Default Mode (see chapter 5).
- Where necessary, measure the voltages in the power supply section both in normal operation (①) and in standby (⏻). These values are indicated by means of the appropriate symbols.
- The semiconductors indicated in the circuit diagram and in the parts lists, are interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors

3. Directions for Use



Unpacking and wall mounting instructions

For the unpacking instructions follow the illustrated steps printed on the packaging (outside and inside). For the wall mounting instructions follow the illustrated steps ❹ to ❻ printed on the separate leaflet.

Make sure that the wall mount is being fixed securely enough so that it meets safety standards. The weight of the monitor (excl. packaging) is about 24 kg.

Note: Stands are optional accessories. Consult your dealer.

Connect your TV receiver box

See the separate supplied instruction manual with your TV receiver box.

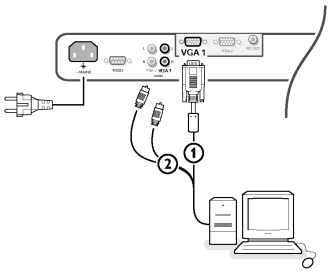
Connect your computer

To the TV receiver box

See the illustration in the inside frontcover of this handbook.

❶ Connect one end of a VGA cable to the video card of the computer and the other end to the **VGA IN** connector at the rear side of the TV receiver box. Fix the connectors firmly with the screws on the plug.

❷ In case of a Multimedia computer, connect the audio cable to the audio outputs of your Multimedia computer and to the **AUDIO VGA R** (right) and **L** (left) inputs of the TV receiver box.



Directly to the monitor

❶ Connect one end of a VGA cable ① to the video card of the computer and the other end to the **VGA 1** connector at the rear side of the monitor. Fix the connectors firmly with the screws on the plug.

❷ In case of a Multimedia computer, connect the audio cable ② to the audio outputs of your Multimedia computer and to the **AUDIO VGA 1 R** (right) and **L** (left) inputs of the TV monitor.

Daisy chaining

The Loop Through facility makes it possible to make a daisy chain with a second monitor.

❸ Connect one end of another VGA cable to the **VGA 2** connector at the rear side of the monitor and the other end to the **VGA 1** connector of a second monitor.

❹ In case of a Multimedia computer, also connect audio cables to the **AUDIO L** and **R** outputs of the original monitor and to the **AUDIO L** and **R** inputs of the second monitor.

The RC out jack next to the VGA 2 connector makes it possible to daisy chain remote control signals to other equipment.
This output cannot be used to daisy chain a second monitor.

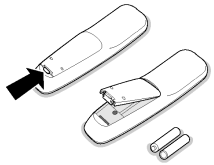
Monitor Display modes

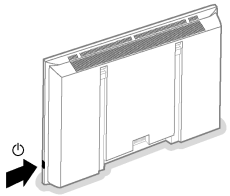
VGA	640x480	60, 72, 75, 85 Hz
Wide VGA	848x480	60 Hz
Wide VGA	852x480	60 Hz
MAC	640x480	66.67 Hz
MAC	832x624	74.55 Hz
MAC	1024x768	74.93 Hz
MAC	1152x870	75 Hz
SVGA	800x600	56, 60, 72, 75, 85 Hz
XGA	1024x768	60, 70, 75, 85 Hz
SXGA	1280x1024	60, 72 Hz

When a VGA computer is connected, the display selection is made automatically.

A message is displayed when the monitor does not support the connected VGA mode. Switch your computer to a correct display mode.

Operation





1. **Insert the mains plug** supplied into the mains inlet at the back of the monitor and in the wall socket.
 For safety, please, only use the supplied rim-earthed mains cord which has to be inserted in a grounded socket.

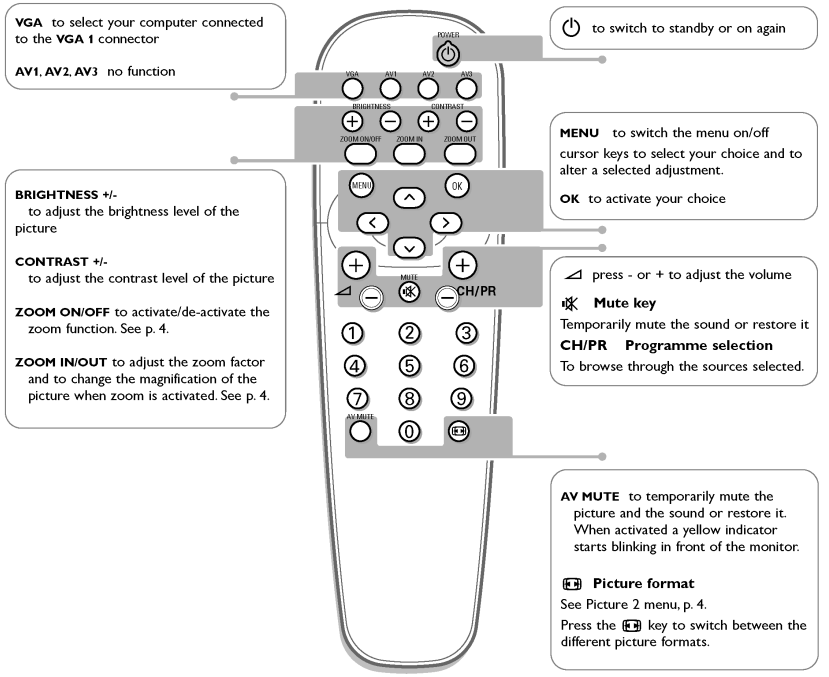
2. **Remote control:** remove the cover of the battery compartment.
 Insert the 2 batteries supplied (Type R6/AA-1.5V).
 The batteries supplied do not contain the heavy metals mercury and cadmium. Nevertheless in many countries batteries may not be disposed of with your household waste. Please check on how to dispose of batteries according to local regulations.

3. Make sure that your TV receiver box and/or PC are switched on and that your PC is in the correct display mode.

4. **Switch the monitor on :** Press the on/off key ⏻ at the right side of the monitor.
 A green indicator lights up and the screen comes on.
 When the monitor does not receive a supported VGA signal and is not connected to a receiver box, the screen switches to standby and the red indicator lights up.

 When you switch on your monitor **for the first time**, and the monitor is not connected to a TV receiver box, the language menu automatically appears on the screen. The explanation appears in different languages one at a time.
 Follow the instructions on screen to select the correct language or see Setup menu, Language, p. 5.

Use of the remote control



VGA to select your computer connected to the **VGA 1** connector

AV1, AV2, AV3 no function

BRIGHTNESS +/-
to adjust the brightness level of the picture

CONTRAST +/-
to adjust the contrast level of the picture

ZOOM ON/OFF to activate/de-activate the zoom function. See p. 4.

ZOOM IN/OUT to adjust the zoom factor and to change the magnification of the picture when zoom is activated. See p. 4.

⏻ to switch to standby or on again

MENU to switch the menu on/off
cursor keys to select your choice and to alter a selected adjustment.

OK to activate your choice

press - or + to adjust the volume

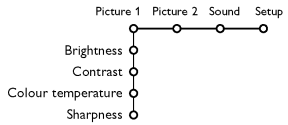
Mute key
Temporarily mute the sound or restore it

CH/PR Programme selection
To browse through the sources selected.

AV MUTE to temporarily mute the picture and the sound or restore it. When activated a yellow indicator starts blinking in front of the monitor.

Picture format
See Picture 2 menu, p. 4.
Press the key to switch between the different picture formats.

Use of the menus and the menu system



1. Press the **MENU** key on the remote control to summon the different menu headers.
2. Press the cursor left/right to move the cursor horizontally through the menu headers.
3. Press the cursor down to access the menu.

 In case of a slider, move the cursor left/right to adjust.

 In case of a list with options, move the cursor right to enter and use the cursor up/down to select an option.
 Press the cursor left to leave the options list.
4. Press the **MENU** key again to switch off the menu.

Note: Sometimes not all the menu items are visible on the screen.
Press the cursor down until all the items are displayed.

Only when the US English language has been selected (see Setup menu, Language, p. 5), the menu items will be displayed with additional icons.

Operation

Press the **MENU** key on the remote control to summon the main menu.

Picture 1 menu



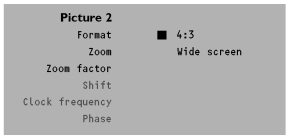
Brightness
This control allows you to adjust the brightness level of the picture.

Contrast
This control allows you to adjust the contrast level of the picture.

Colour temperature
This control allows you to select the colour temperature of the picture.
Move the cursor up/down to make a selection.
Press the cursor left to return to the Picture 1 menu.

Sharpness
This control allows you to adjust the edge definition of a picture.

Picture 2 menu





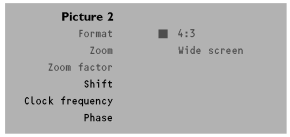
4:3 Wide screen

In this menu you are allowed to adjust attributes which are relevant for the picture on the display, like format, zoom, size, etc.

Format
Select **Format** to summon a list of **available** display formats for showing images in the traditional 4:3 proportions.
Press the cursor up/down to select another display format: 4:3 or Wide screen.

Zoom
Select **Zoom On** to activate the zoom function.
You may also activate the zoom function with the **ZOOM ON/OFF** key on the remote control.
Press the cursor left/right, up/down to select which part of the screen will be zoomed.

Zoom factor
Select **Zoom factor** and press the cursor left/right to adjust the zoom factor and to change the magnification of the picture.
If zoom is not active, Zoom Off, changing the magnification factor will have no effect on the displayed picture.



Clock frequency
This control allows you, when necessary, to adjust the values of the clock frequency so that especially text can be displayed with an optimal overall sharpness.

Use the cursor left/right to adjust.

Shift

This control allows you, when necessary, to move the picture in a horizontal or vertical way.

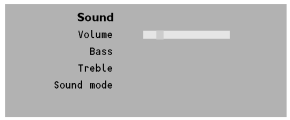
1. Use the cursor left/right to adjust.
2. Press the **OK** key when done.

Phase

This control allows you, when necessary, to adjust the pixel phase of the picture to avoid picture interference.

Use the cursor left/right to adjust.

Sound menu



Volume
This control allows you to adjust the volume level.

Bass
Bass attenuates or amplifies the low-frequency response of the sound of the loudspeakers.

Treble
Treble attenuates or amplifies the high-frequency response of the sound of the loudspeakers.

Sound mode
This control allows you to switch between mono and stereo sound.

Note: Bass, Treble and Sound mode will not be available when a TV receiver box is connected to the monitor and a VGA source is selected.

Setup menu



Language

1. Use the cursor down to select **Language**.
2. Press the cursor right to enter the list of selectable languages.
3. Use the cursor up/down to scroll through the list and to bring up other languages which are not displayed on the screen at present.

Tips

Ambient temperature

Do not hang up the monitor above a central heating or other heating sources.

Care of the screen

Clean the anti-reflex coated flat glass screen with a slightly damp soft cloth. Do not use abrasives solvents as it can damage the glass surface of the screen.

Plasma Display characteristics

Caution: A video source (such as a video game, DVD, or TV information channel) which shows a constant non-moving pattern on the TV screen, can cause damage to the screen. When your Flat-TV is continuously used with such a source, the pattern of the non-moving portion of the game (DVD, etc.) could leave an image permanently on the screen. When not in use, turn the video source **OFF**.
Regularly alternate the use of such video sources with normal TV viewing.
When switching over to another picture after having displayed the same still picture for a long time (many hours), it may happen that some parts from the previous picture will remain on screen due to a kind of memory effect. This ghost picture will disappear after some time. To avoid this effect change the pictures regularly or for PC use you can turn on a screen saver in your computer.
For video signals, Philips has built in an automatic shift of the picture every 5 minutes to avoid this effect and to prolong the life of the screen.
Very incidentally and after a longer period of unuse (approx. 1 year) the screen may display some strange colour deficiencies. This is quite normal for plasma displays and these effects will disappear after the set has been turned on for some time.
A plasma display consists of more than 2,6 million colour pixels. It is within industry standards that very few pixels (< 0.001%) may be defective, even for a new set. There is however no reason to doubt about the quality of the set.
The plasma display technology operates with rare gases which are being influenced by air pressure.
Up to an altitude of 2000 m above sea-level, the display is functioning fine.
Operating the set at a higher altitude, the picture becomes unstable and the picture performance is deteriorating. After bringing the set below 2000 m it works fine again. Transportation has no influence.

Control of peripheral equipment

The infrared signals of the screen may influence the reception sensitivity of other peripherals. Solution: replace the batteries of the remote control or change position of other equipment. E.g. keep away a wireless headphone from within a radius of 1.5 m.

No stable or not synchronised VGA picture

Check if you have selected the correct VGA mode in your PC.

No picture or no sound

Are the supplied cables connected properly? (The power cable to the display, the VGA cables, the audio cables,...)
Is your PC or TV receiver box switched on?
Do you see a black screen and the indicator on front of the monitor lights up green, this means that the display mode is not supported.
Switch your VGA source to a correct mode.

Remote control

If your monitor no longer responds to the remote control, the batteries may be exhausted.

If your problem is not solved:

Switch your monitor off and then on again.

Never attempt to repair a defective monitor yourself.

Check with your dealer or call a TV technician.

Transport

Keep the original packaging to transport the monitor if needed.

End of life directives

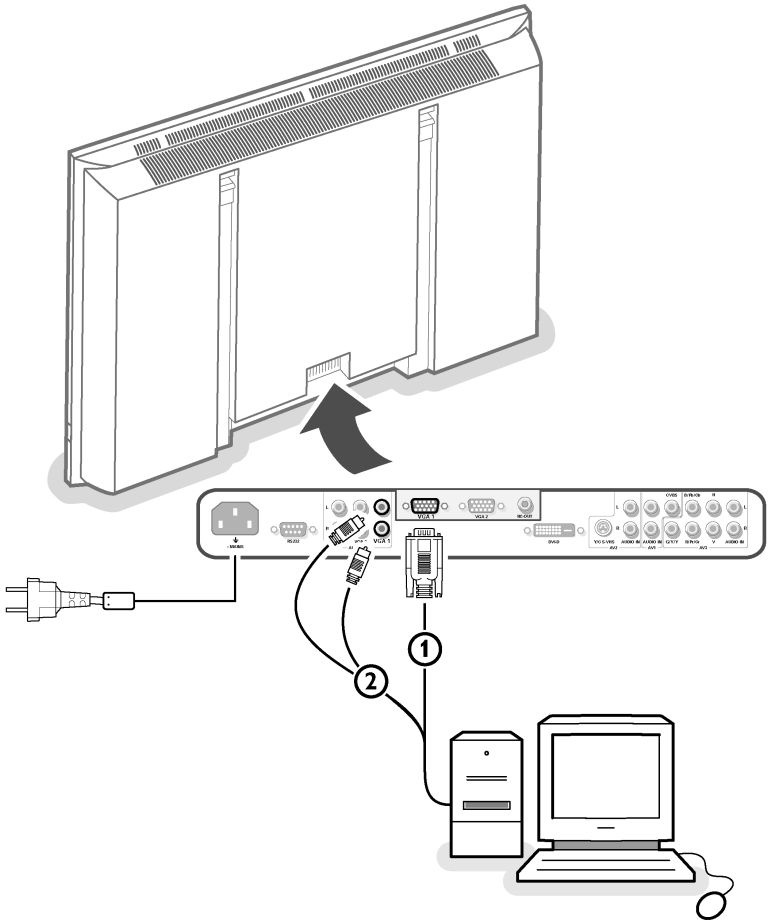
Philips is paying a lot of attention to produce environmentally-friendly in green focal areas. Your new monitor contains materials which can be recycled and reused.
At the end of its life specialised companies can dismantle the discarded monitor to concentrate the reusable materials and to minimise the amount of materials to be disposed of.
Please ensure you dispose of your old monitor according to local regulations.

How to dispose of batteries ?

The batteries supplied do not contain the heavy metals mercury and cadmium. Nevertheless in many countries batteries may not be disposed of with your household waste. Please ensure you dispose of batteries according to local regulations.

Miscellaneous

. Ambient temperature: + 5~ + 40°C
. Maximum operating altitude: 2000 m
. Mains: Auto Voltage ranging from 95V to 264V
. Power consumption: around 280 W
. Standby consumption: < 1 W
. Weight (excl. packaging)
Display: 24 kg
. Dimensions (wxhxd):
Display: 96.4 x 51.2 x 8.9 cm
. Wall mounting bracket included



English

Unpacking and wall mounting instructions

For the unpacking instructions follow the illustrated steps printed on the packaging (outside and inside). For the wall mounting instructions follow the illustrated steps 4 to 6 printed on the separate template and in the supplied booklet.

Make sure that the wall mount is being fixed securely enough so that it meets safety standards. The weight of the monitor (excl. packaging) is about 53 Lbs or 79 Lbs, depending on the screen size (32" or 42").

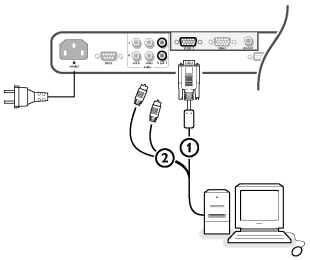
Note: stands are optional acccessories. Consult your dealer.

Connect your computer

Directly to the monitor

1. Connect one end of a VGA cable (1) to the video card of the computer and the other end to the **VGA 1** connector at the rear side of the monitor. Fix the connectors firmly with the screws on the plug.
2. In case of a Multimedia computer, connect the audio cable (2) to the audio outputs of your Multimedia computer and to the **AUDIO VGA 1 R** (right) and **L** (left) inputs of the TV monitor.

VGA 2: The video connector for VGA 2 can be programmed to become an input or an output via the Setup menu, see p. 8. The function of being input or output is determined by the used mode. If the monitor is used in TV mode, the VGA 2 connector is VGA output. If the monitor is used in monitor mode,the connector is VGA input or output.



To a TV receiver box

See the handbook of the TV receiver box.

1. Connect one end of a VGA cable to the video card of the computer and the other end to the **PC/MAC IN** connector at the rear side of the TV receiver box. Fix the connectors firmly with the screws on the plug.
2. In case of a Multimedia computer, connect the audio cable to the audio outputs of your Multimedia computer and to the **AUDIO IN R** (right) and **L** (left) inputs of the TV receiver box.

Note: Only use the VGA cable supplied with the monitor.

Daisy chaining

The Loop Through facility makes it possible to make a daisy chain with a second monitor.

3. Connect one end of another VGA cable to the **VGA 2** connector at the rear side of the monitor and the other end to the **VGA 1** connector of a second monitor.
4. In case of a Multimedia computer, also connect audio cables to the **AUDIO L** and **R** outputs of the original monitor and to the **AUDIO L** and **R** inputs of the second monitor.

The RC out jack next to the VGA 2 connector makes it possible to daisy chain remote control signals to other equipment.
This output cannot be used to daisy chain a second monitor.

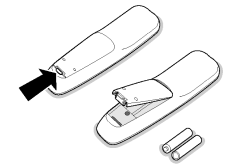
Computer Display modes

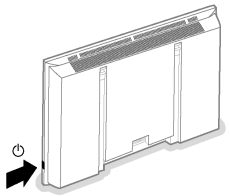
VGA	640x480	60, 72, 75, 85 Hz
Wide VGA	848x480	60 Hz
Wide VGA	852x480	60 Hz
MAC	640x480	66.67 Hz
MAC	832x624	74.55 Hz
MAC	1024x768	74.93 Hz
MAC	1152x870	75 Hz
SVGA	800x600	56, 60, 72, 75, 85 Hz
XGA	1024x768	60, 70, 75, 85 Hz
SXGA	1280x1024	60 Hz, 72 Hz (not with DVI-D source)

When a VGA computer is connected, the display selection is made automatically.

A message is displayed when the monitor does not support the connected VGA mode. Switch your computer to a correct display mode.

Operation

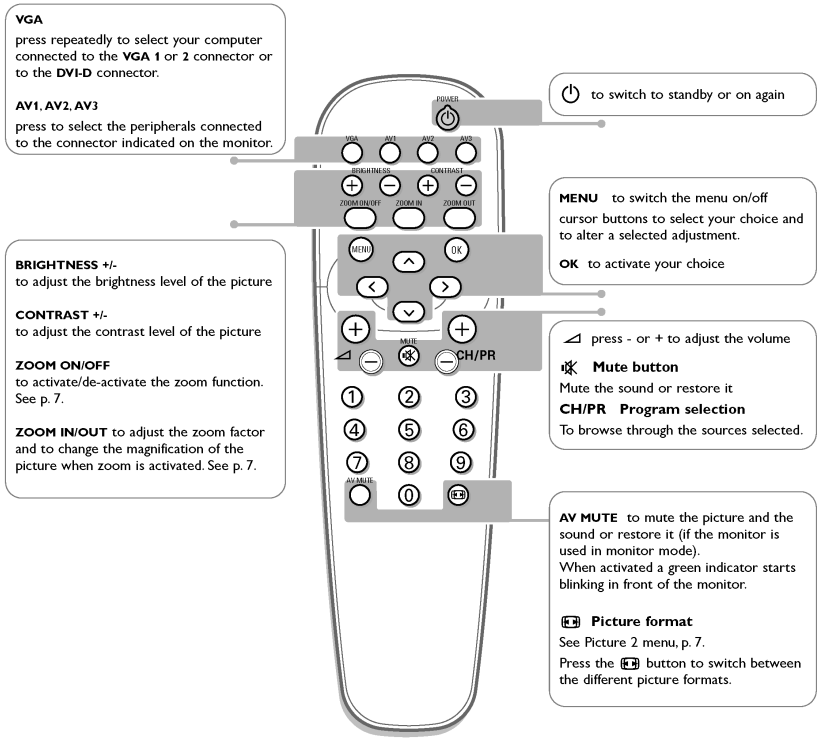




1. **Insert the mains plug** supplied into the mains inlet at the back of the monitor and in the wall socket. For safety, please, only use the supplied rim-earthed mains cord which has to be inserted in a grounded socket.
2. **Remote control:** remove the cover of the battery compartment.
 Insert the 2 batteries supplied (Type LR6/AA-1.5V).
 The batteries supplied do not contain the heavy metals mercury and cadmium. Nevertheless in many countries batteries may not be disposed of with your household waste. Please check on how to dispose of batteries according to local regulations.
3. Make sure that your TV receiver box and/or PC are switched on and that your PC is in the correct display mode.
4. **Switch the monitor on :** Press the power key ⏻ at the right side of the monitor.
 A green indicator lights up and the screen comes on.
 When the monitor does not receive a supported VGA signal and is not connected to a receiver box, the screen switches to standby and the red indicator lights up.

 When you switch on your monitor **for the first time**, and the monitor is not connected to a TV receiver box, the language menu automatically appears on the screen. The explanation appears in different languages one at a time.
 Follow the instructions on screen to select the correct language or see Setup menu, Language, p. 8.

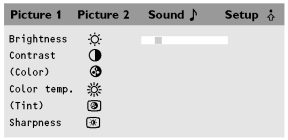
Use of the remote control



On screen information

When the monitor is used in the monitor mode, information about the active source (**AV1**, **AV2**, **AV3**, **VGA1**, **VGA2** or **DVI-D**), and the supported video, VGA or HD-format of the selected source is displayed on the screen together with the selected picture format and icons informing about selected sound mode and AV or audio mute.

Use of the menus and the menu system



1. Press the **MENU** button on the remote control to summon the different menu headers.
2. Press the cursor left/right to move the cursor horizontally through the menu headers.
3. Press the cursor down to access the menu.

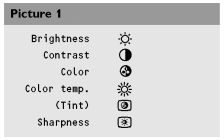
 In case of a slider, move the cursor left/right to adjust.

 In case of a list with options, move the cursor right to enter and use the cursor up/down to select an option.
 Press the cursor left to leave the options list.
4. Press the **MENU** button again to switch off the menu.

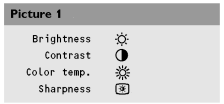
Note: Sometimes not all the menu items are visible on the screen.
Press the cursor down until all the items are displayed.

Only when the US English language has been selected (see Setup menu, Language, p. 8), the menu items will be displayed with additional icons.

SD video-mode



VGA-mode + HD video mode



Operation

Press the **MENU** button on the remote control to summon the main menu.

Picture 1 menu

Brightness
This control allows you to adjust the brightness level of the picture.

Contrast
This control allows you to adjust the contrast level of the picture.

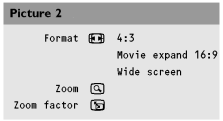
Color *(only available when the source is **AV1**, **AV2** or **AV3 YCbCr**)*
This control allows you to adjust the saturation level of the colors to suit your personal preference.

Color temperature
This control allows you to select the color temperature of the picture.
Move the cursor up/down to make a selection.
Press the cursor left to return to the Picture 1 menu.

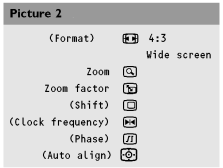
Tint *(only with NTSC signals and when the source is **AV1** or **AV2**)*
This control allows you to compensate for the color variations in NTSC encoded transmissions.

Sharpness
This control allows you to adjust the edge definition of a picture.

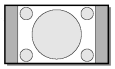
SD video-mode



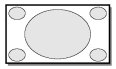
VGA-mode + HD video mode



4:3 VGA-mode

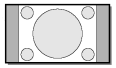


4:3

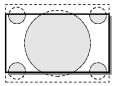


Wide screen

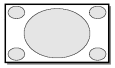
SD video-mode



4:3



Movie expand 16:9



Wide screen

Picture 2 menu

Zoom

Select **Zoom On** to activate the zoom function.
You may also activate the zoom function with the **ZOOM ON/OFF** button on the remote control.
If no zoom is active, press the cursor left/right, up/down to select which part of the screen will be zoomed.

Zoom factor

Select **Zoom factor** and press the cursor left/right to adjust the zoom factor and to change the magnification of the picture.
If zoom is not active, changing the magnification factor will have no effect on the displayed picture.

Format *(only available in 4:3 VGA mode and SD video mode)*
Select **Format** to summon a list of **available** display formats.
Press the cursor up/down to select another display format: 4:3, Movie expand 16:9 or Wide screen.
Note: Movie expand 16:9 is not available in VGA mode.

Shift *(only available in VGA mode on VGA1 or VGA2 and in one of the HD modes. See Connect Peripheral Equipment, p. 9.)*

This control allows you, when necessary, to move the picture in a horizontal or vertical way.

1. Use the cursor left/right, up/down to adjust.
2. Press the **OK** button when done.

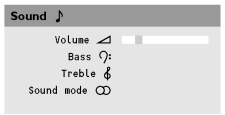
Clock frequency *(only available in VGA mode on VGA 1 or VGA 2. See Connect Peripheral equipment, p. 9.)*
This control allows you, when necessary, to adjust the values of the clock frequency so that especially text can be displayed with an optimal overall sharpness.

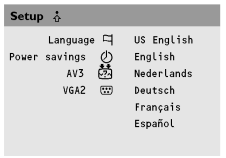
Use the cursor left/right to adjust.

Phase *(only available in VGA mode on VGA 1 or VGA 2. See Connect Peripheral equipment, p. 9.)*
This control allows you, when necessary, to adjust the pixel phase of the picture to avoid picture interference.

Use the cursor left/right to adjust.

Auto align *(only available in VGA mode on VGA1 or VGA2 and in one of the HD modes. See Connect Peripheral Equipment, p. 9.)*
This control allows you to automatically adjust the shift, the clock frequency and the phase in VGA mode and the shift in HD modes.
Press **OK** to execute.





Sound menu

Volume

This control allows you to adjust the volume level of the sound from the speakers.

Bass

Bass attenuates or amplifies the low-frequency response of the sound from the loudspeakers.

Treble

Treble attenuates or amplifies the high-frequency response of the sound from the loudspeakers.

Sound mode

This control allows you to switch between mono and stereo sound.

Note: Bass, Treble and Sound mode will not be available in VGA loop through mode, i.e. when a TV receiver box is connected to the monitor and a VGA source is selected.

Setup menu

Language

1. Use the cursor down to select **Language**.
2. Press the cursor right to enter the list of selectable languages.
3. Use the cursor up/down to scroll through the list and to bring up other languages which are not displayed on the screen at present.
 Note: Only with the US English language, the menu items will be displayed with additional icons.

Power savings

This control allows you to overrule the automatic power savings feature.
In case **Power savings** is switched **Off**, the power always remains on until the monitor is forced to standby.

1. Use the cursor down to select **Power savings**.
2. Press the cursor left/right to select **On** or **Off**.

AV3

This control allows you to set the AV3 input to HD-RGB, YCbCr or HD-YPbPr. When having selected **Auto**, the monitor makes the selection automatically between YCbCr, HD-YPbPr or HD-RGB.
See also p. 9, Equipment with Component Video Output connectors.

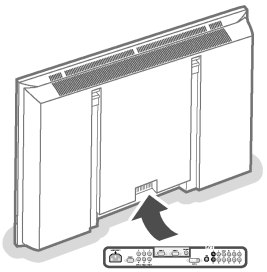
1. Use the cursor down to select **AV3**.
2. Press the cursor right to enter the list with options.
3. Press the cursor up/down to select one of the options.

VGA2

This control allows you to select whether to set the VGA2 connector as input, output or even HD-input.

1. Use the cursor down to select **VGA2**.
2. Press the cursor right to enter the list with options: **VGA IN**, **VGA OUT** or **HD IN**.
3. Press the cursor up/down to select one of the options.
 Note: AV3 and VGA2 will not be available in VGA loop through mode, i.e. when a TV receiver box is connected to the monitor and a VGA source is selected.

Connect Peripheral Equipment



You may connect 3 possible VGA sources (**VGA1**, **VGA2** or **DVI-D**) and 3 possible video sources (**AV1**, **AV2** and **AV3**) to the monitor.
The following diagrams show you where you can connect your peripheral equipment.

Note: in case the monitor is operating in combination with a TV receiver box (TV mode), the AV inputs on the monitor will be disabled and the VGA2 connector becomes an output.

Equipment with Y/C-SVHS output connectors



1. Connect the video cable to the **AV2** connector.
2. Connect the audio cables to the equipment's **AUDIO L** and **R** sockets and to the **AUDIO L** and **AUDIO R AV2** sockets on the monitor.

Equipment with CVBS output connectors



1. Connect the video cable to the **AV1** connector.
2. Connect the audio cables to the equipment's **AUDIO L** and **R** sockets and to the **AUDIO L** and **R AV1** sockets on the monitor.

Equipment with Component Video Output connectors



Note: AV3 can handle the following video signals: YCbCr, HD-YPbPr and HD-RGB. The discrimination between the various input formats and the appropriate video processing is done automatically. It is however possible to overrule the automatic detection. See Setup menu, p. 8.

1. Connect the video cables of your equipment with YPbPr output with composite sync on Y, or of your equipment with YCbCr output with composite sync on Y to the YPbPr, resp. YCbCr input **AV3 IN** sockets of the monitor.
2. Connect the video cables of your equipment with RGB output with separate Horizontal and Vertical sync to the RGB input sockets and to the H and V sockets **AV3** of the monitor.
3. Connect the audio cables to the equipment's **AUDIO L** and **R** sockets and to the **AUDIO IN L** and **AUDIO IN R AV3** sockets on the monitor.

Note: when High Definition signals are inputted to the monitor via the YPbPr/RGB input, the monitor switches to the HD Video Mode.

The following HD and ED video modes are supported by the monitor on the YPbPr, RGB and VGA2 HD input:

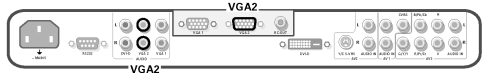
1920x1080/60I 720x480/60P
1280x720/60P 720x576/50P

The following SD video modes are supported by the monitor on the YCbCr input:

720x480/60I
720x576/50I

Note: you should make the correct selection for AV3 in the Setup menu, p. 8.

High Definition equipment with VGA connector



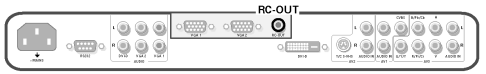
1. Connect the VGA output of your equipment to the **VGA2** connector.
2. Connect the audio cables to the equipment's **AUDIO L** and **R** sockets and to the **VGA2 AUDIO L** and **R** sockets on the monitor.
*Note: you should select **HD IN** for **VGA2** in the Setup menu. (See p. 8.)*

Digital DVI output of your PC (DVI-D) or DVD player



1. Connect the Digital DVI output of your PC or DVD-player to the **DVI-D** connector.
2. Connect the audio cables to the **DVI-D AUDIO L** and **R** sockets on the monitor.

RC out connector



This connector allows you to daisy chain remote control signals to other equipment (e.g. AV receiver, IR repeater) which have an electrical RC in.

Note: it is not possible to daisy chain a second monitor.

Serial I/O port RS232



The RS232 connector is only to be used with the monitor as stand alone. This connector allows you to control the monitor via your PC (as a replacement of the remote control). **Software is supplied on CD-ROM**.

Note: This connector can also be used for dealer service tools.

Supplied driver software

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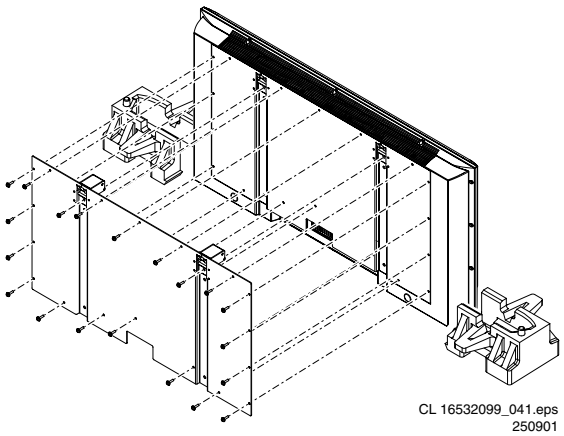
4. Mechanical Instructions

Index of this chapter:

- Service Position Monitor
- Rear Cover Removal
- Service Position Panels
- PDP and Glass Plate Replacement
- Re-assembly

Note: Figures below can deviate from the actual situation, due to different set executions.

4.1 Service Position Monitor



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250901

Figure 4-1 Service Position

First, put the monitor in its service position. Therefore, disconnect all cables connected to the monitor and take the monitor of the wall (or tabletop stand). Then, place the monitor in the re-inforced transport cushions that function also as service stand (you can order them separately under code 3122 126 40612). See figure above.

4.2 Rear Cover Removal

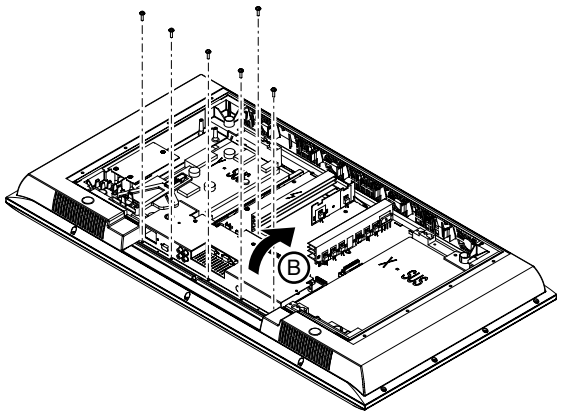
To be able to access or measure the panels, remove the rear cover (metal back plate):
Warning: make sure that the mains power is disconnected before you remove the metal back plate.

1. Remove all fixation screws of the back plate, as indicated in the figure above (five at the top, five at each side, seven at the bottom, and the two larger ones just below the ‘wall mounting holes’).
2. Remove the metal back plate. Make sure that wires and flat foils are not damaged during plate removal.

4.3 Service Position Panels

4.3.1 SCAVIO Panel

Solder-side SCAVIO



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Figure 4-2 Service position SCAVIO (1)

To access the panel:

1. Remove the cables from connectors 0320, 0305, 0301, 0319 and 0388 on the SCAVIO panel.
2. Remove the power cable from the mains power inlet to the power supply (connector 0308).
3. Remove the five screws at the bottom of the SCAVIO panel cover plate.
4. Hold the SCAVIO panel while removing the top screw, in order to prevent that it will fall.
5. Take the panel out, and turn it 180 degrees, so that you face the solder side of the SCAVIO panel.
6. Reconnect all cables. Use a standard power cable to connect the mains directly to PSU-connector 0308, and use the 'LED/Switch panel' service kit 3122 785 90410 (as the original cable is too short).

Caution: When measuring, watch out for the 'hot' left heat sink of the PSU!

Another way to measure the SCAVIO panel:

1. Remove the five screws at the bottom of the SCAVIO panel cover plate.
2. Hold the SCAVIO panel while removing the top screw, in order to prevent that it will fall.
3. Put a piece of paper (or cardboard) in front of the Power Supply.
4. Take the panel out, and turn it upward [B], so that you face the solder-side of the SCAVIO panel.

Caution: Make sure that the metal connector plate does not touch any 'hot' part of the Power Supply (heatsink).

Component-side SCAVIO

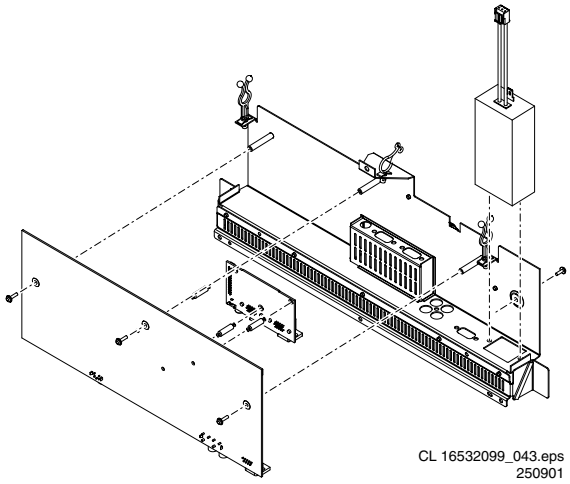


Figure 4-3 Service position SCAVIO (2)

To access the other side of the SCAVIO panel:
1. Disconnect all cables going to the SCAVIO panel.
2. Remove all screws at the connectors of the connector plate, see figure 'Solder-side SCAVIO'.
3. Remove the three fixation screws that connect the SCAVIO panel to the connector plate, see figure 'Component-side SCAVIO'.
4. Reconnect the SCAVIO panel, be careful: do not make a short-circuit!

4.3.2 VGA Connector Panel

How to remove the VGA Connector panel:
1. Squeeze the plastic pins that attach this panel to the SCAVIO board, while you pull it carefully upwards.
2. Unplug the flat foil cable.

4.3.3 Power Supply Panel

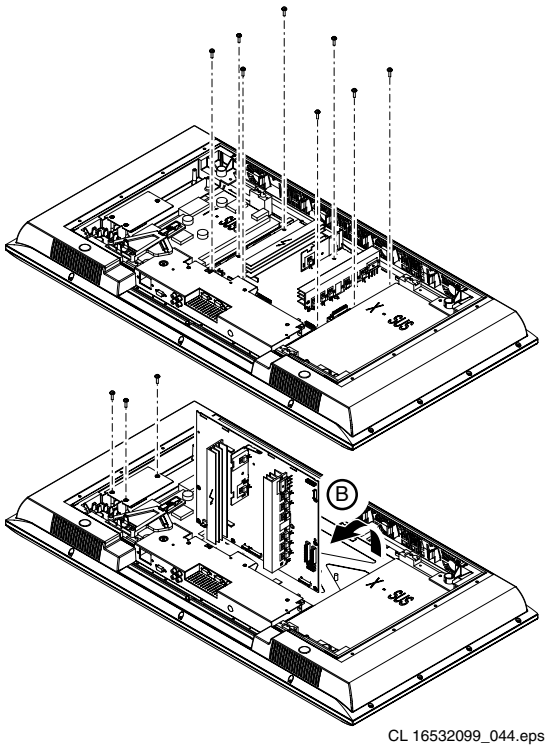


Figure 4-4 Service Position Power Supply

It is possible to perform most measurements at the component level side (thus, the way the panel is mounted in the set). However, to reach the copper side of the Power Supply:
1. Unplug the power cable.
2. Remove all eight fixation screws from the Power Supply: three at each side and two in the middle.
3. Hinge the Power Supply forward, so that you can reach the copper side. Use a non-conducting part underneath, to support the PWB (e.g. a carton box). Caution: make sure that, when you hinge the Power Supply forward, you do not damage the cables. Pay special attention to the flat cable (on connector 0307) and the cable on connector 0306, because they can be easily damaged by the sharp edge of the connector plate.
4. To remove the Power Supply, unplug all cables.
5. Remove the Power Supply.

4.3.4 Audio Amplifier Panel

The solder-side of this panel is directly accessible. To access the component-side, or to remove the whole panel, unscrew the three fixation screws (see figure 'Power Supply Panel'), and (re)move the panel.

4.3.5 LED/Switch Panel and Speakers

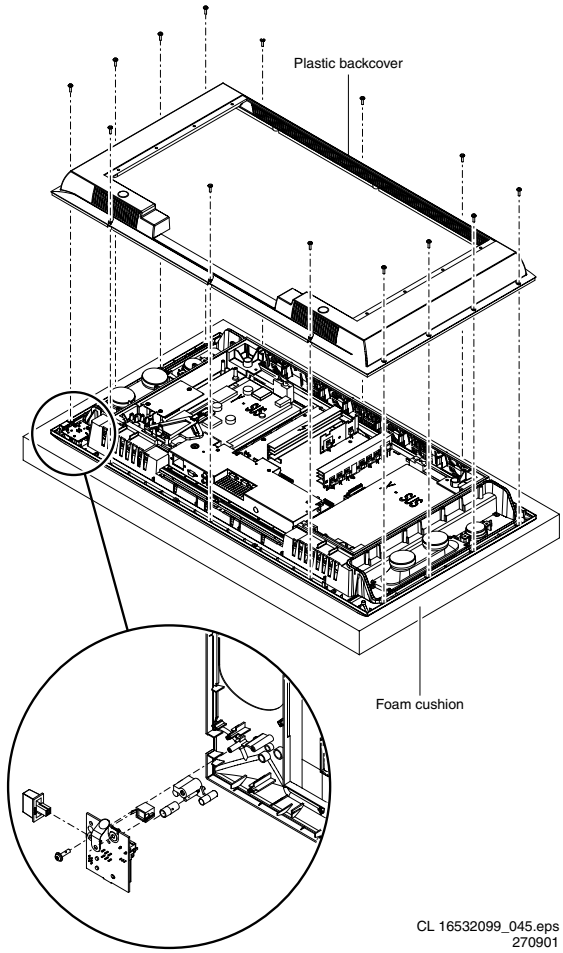


Figure 4-5 Service Position LED/Switch Panel and Speakers

To access or replace the LED/Switch panel and/or speakers:
1. Take the monitor from its service stand, and put it (face down) on a soft surface (blanket or foam cushion), to make sure that you do not damage the front glass plate.
2. Unscrew all fixation screws of the plastic back cover: five at all sides.
3. Lift and remove the plastic back cover.
4. You can access now the LED/Switch panel and/or the speakers.

4.3.6 LED/Switch panel

To measure the component-side, or to remove the LED/Switch panel, unscrew one fixation screw (see enlarged part of figure 'LED/Switch Panel and Speakers'), and remove the panel.

4.3.7 Loudspeakers

When you have removed the plastic back cover, you must replace the speaker-box sealing foams (12nc: 3122 358 76221). This, to ensure that the loudspeakers are airtight. Do not stretch the foam during mounting. Pay special attention to the corners, to make sure that the foam is not stretched and that it is pushed in the corners.

4.4 PDP and Glass Plate Replacement

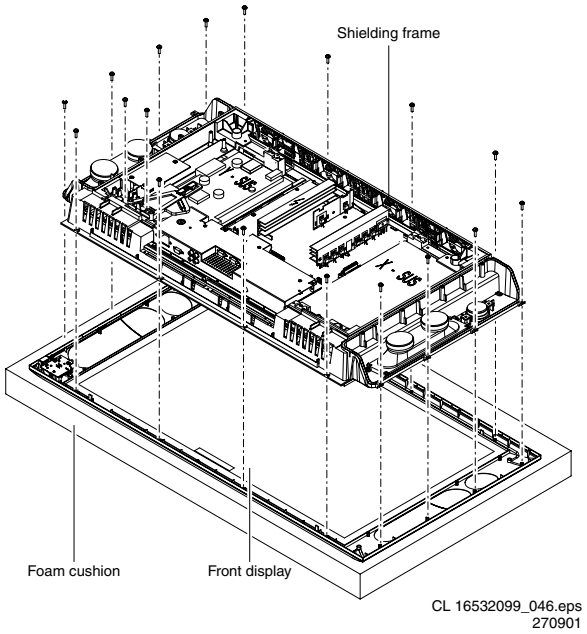


Figure 4-6 Exchange Glass Plate

Exchange the glass plate

1. Take the monitor from its service stand, and put it (face down) on a soft surface (blanket or foam cushion), to make sure that you do not damage the front glass plate.
2. Remove the metal back plate as described in paragraph 'Rear Cover Removal'.
3. Unscrew all fixation screws of the plastic back cover: four at the left and right side, three at the bottom and top side.
4. Lift and remove the plastic back cover.
5. Unscrew two fixation screws of the triangular shaped cable holder at the left bottom, see figure 'Exchange Glass Plate'.
6. Unscrew all fixation screws of the (metallised) shielding frame, four at both sides and four at the top and bottom, see figure 'Exchange Glass Plate'.
7. Unplug the cable of the LED/Switch panel, connector 0320.
8. You can now remove the (metallised) shielding frame, together with the PDP, Audio panel, Power supply and SCAVIO panel attached to it, see figure 'Exchange Glass Plate'. **Note:** To prevent scratches, make sure to put the shielding frame together with the PDP on a soft surface.
9. Replace the glass plate.

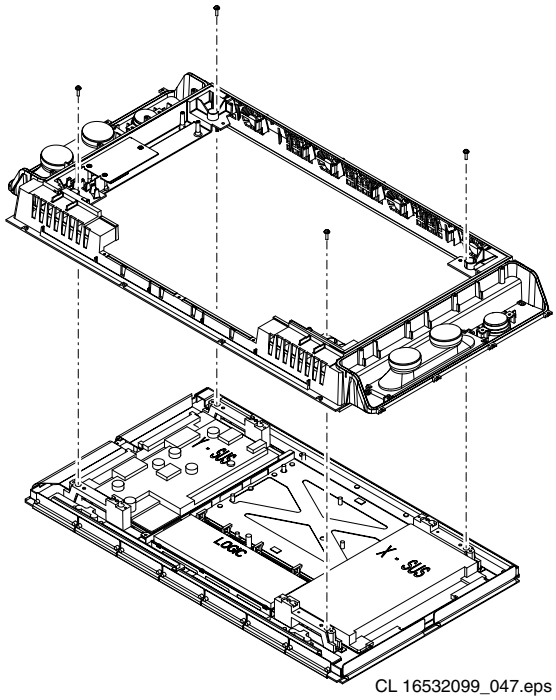


Figure 4-7 Exchange PDP

To exchange the PDP panel:

1. Take out the SCAVIO panel and Power Supply panel, as described earlier.
2. Unscrew all fixation screws of the (metallised) shielding frame (two at the top and two at the bottom, see figure 'Exchange PDP').
3. The shielding frame can now be taken off the PDP.
4. Replace the PDP.

4.5 Re-assembly

To re-assemble the whole set, do all processes in reverse order.

Notes:

- You must replace the speaker-box sealing foam, in case the plastic rear cover has been (re)moved.
- While re-assembling, make sure all the cables are in their original position and make sure all the EMC foams are present to ensure 'EMC tightness'.

5. Service Modes, Error Codes and Fault Finding

Index of this chapter:
1. Test points
2. Service Modes
3. Problems and Solving Tips (related to CSM)
4. ComPair
5. Error Codes
6. The Blinking LED Procedure
7. Protections
8. Repair Tips

5.1 Test Points

The chassis is equipped with test points (I- and F-points) printed on the circuit board assemblies. See test point overview in chapter 6.

Perform measurements under the following conditions:
- Service Default Mode.
- Video: colour bar signal (via PC or VGA-generator).
- Audio: 1 kHz, 2 V_{PP} (via PC or VGA-generator).

5.2 Service Modes

Service Default Mode (SDM) and Service Alignment Mode (SAM) offer several features for the service technician, while the Customer Service Mode (CSM) is used for communication between a Philips Customer Care Centre (P3C) and a customer.

There is also the option of using ComPair, a hardware interface between a computer (see requirements) and the FTV chassis. It offers the ability of structured trouble shooting, test pattern generation, error code reading, software version readout and software upgrading.
Minimum requirements: a Pentium Processor, Windows 9x/NT/ 2000/XP, and a CD-ROM drive (see also paragraph 5.4).

5.2.1 Service Default Mode (SDM)

Purpose
- To create a pre-defined setting to get the same measurement results as given in this manual.
- To override SW protections (only when SDM is entered via the 'service pins' on connector 0382).
- To start the blinking LED procedure.

Specifications
- All picture settings at 50% (brightness, contrast, etc.).
- Colour temperature is set to 'normal'.
- Bass, treble and balance at 50%; volume at 25%.
- All service-unfriendly modes (if present) are disabled, like:
- Video blanking,
- Slow de-mute,
- Anti ageing,
- Automatic switch to Standby when no sync signals are received.

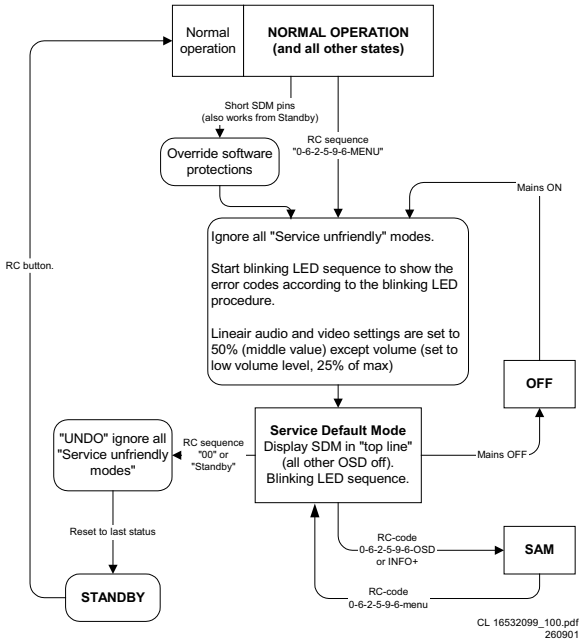


Figure 5-1 SDM Flowchart

How to enter SDM
Use one of the following methods:
- Use the standard RC-transmitter and key in the code **0 6 2 5 9 6**, directly followed by the MENU button.
- Short jumpers 1 and 2 of connector 0382 on the SCAVIO panel.

After entering SDM, a blank screen is visible, with SDM in the upper left side for recognition. The Blinking LED procedure is started and will indicate any possible errors via the (orange) front LED.

How to navigate
To toggle to the SAM mode, use a standard customer RC-transmitter and key in the code **0 6 2 5 9 6**, directly followed by the **OSD (i+)** key.

How to exit
Use one of the following methods (the set returns to its last status):
- Switch the set to STANDBY by pressing the power button on the remote control transmitter (if you switch the set 'off' by removing the Mains power, the set will return in SDM, when the Mains power is re-applied).
- Use the standard RC-transmitter and key in the code **0 0**.

5.2.2 Service Alignment Mode (SAM)

Purpose
- To perform (software) alignments.
- Easy way to identify the commercial type number of the set.
- Easy identification of the used software versions.
- To display (or clear) the error code buffer.
- View operational hours.

Specifications
- Operation hours counter.
- Software version reading.
- Error buffer reading and erasing.
- Software alignments.
- Test pattern generation.

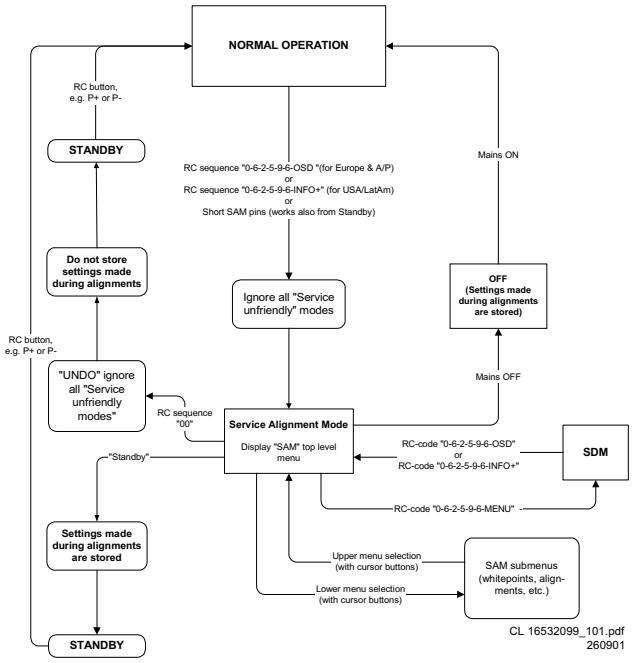


Figure 5-2 SAM Flowchart

How to enter

Use one of the following methods:

- Use a standard RC-transmitter and key in the code **0 6 2 5 9 6** directly followed by the **OSD (i+)** button.
 Note: the OSD (i+) is not available on the original FM24 remote control, therefore use another Philips remote control (e.g. MG, EMG or A10).
- Short jumpers 3 and 4 of connector 0382 on the SCAVIO panel.

The following screen is visible:

Service Alignment Menu	General
Type nr. - AG Code	32FD9944/01S (example)
SW version OTC	AAAABC-X.Y xxxxx
SW version PW	AAAABC-X.Y xxxxx
SW version EPLD	AAAABC-X.Y xxxxx
Errors 1	xx xx xx xx xx
Errors 2	xx xx xx xx xx
Operational hours	xx
Reset error buffer	Press OK to reset
Store	Press OK to store

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Figure 5-3 SAM Menu 'General'

1. **Type Nr.** Gives the commercial type number of the monitor, e.g. 32FD9944/01S.
2. **AG Code.** Is not implemented.
3. **SW Version OTC** (AAAABC-X.Y-xxxxx).
 Note: You will find details of the latest software versions in the chapter 'Software Survey' of the 'Product Survey - Colour Television' publication, which is published four times each year.
 - A = the chassis name (FM23 for 32" displays or FM24 for 42" displays).
 - B = the region (E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM or G = Global).
 - C = the configuration name (B= Basic, E= Enhanced).
 - X = the main software version number.
 - Y = the sub software version number.
 - x = last five digits of 12nc code.
4. **SW Version PW** (AAAABC-X.Y-xxxxx). See description above.
5. **SW Version EPLD** (AAAABC-X.Y-xxxxx). See description above.
6. **Errors 1.** Gives the last five errors of the error buffer. The last detected error is displayed at the most left position. The errors are displayed as 2 digit numbers and separated by a space. When less than 10 errors occurred, the rest of the line(s) is empty. In case of no errors the text 'No Errors' is displayed behind menu item 'Errors 1'. See paragraph 5.5 for a description.
7. **Errors 2.** Gives the first five errors of the error buffer. The last detected error is displayed at the most left position.
8. **Operational hours.** The Operations Hours indicate the time that the display was active with half an hour resolution. It represents the system hours (OTC), not the PDP hours.
9. **Reset error buffer.** Erase the contents of the error buffer. Press 'OK' on your remote control to activate. The content of the error buffer is cleared.
10. **Store.** This will store the performed alignments. Press 'OK' on your remote control to activate.
 Note: if you do not want to store the performed alignments, leave the SAM mode via code 0 0 on your remote control. Do not activate the 'store' item.

How to navigate

Use one of the following methods:

- Select the sub-menu's (upper line) with the CURSOR LEFT/RIGHT keys on the remote control transmitter.
- Select the menu items with the CURSOR UP/DOWN keys. With the CURSOR LEFT/RIGHT keys it is possible to:
 – Activate the selected menu item.
 – Change the value of the selected menu item.
- To toggle to the SDM mode, use the standard customer RC-transmitter and key in the code **0 6 2 5 9 6**, directly followed by the MENU key.

How to exit

Use one of the following methods:

- Switch the set 'off' (with the Mains switch or by pulling the Mains cord).
 Note: new alignment settings are always stored, even when item 'store' was not activated!
- Switch the set to 'standby' by pressing the power button on the remote control transmitter.
 Note: new alignment settings are always stored, even when item 'store' was not activated!
- Use the standard RC-transmitter and key in the code **0 0**.
 Note: new alignment settings are not stored (except when item 'store' was activated)!

5.2.3 Customer Service Mode (CSM)

Purpose

When a customer is having problems with his TV-set, he can call his dealer or helpdesk. The service technician can than ask the customer to activate the CSM, in order to identify the status of the set. Now, the service technician can judge the severness of the complaint. In many cases, he can advise the customer how to solve the problem, or he can decide if it is necessary to visit the customer.
The CSM is a read only mode, therefore modifications in this mode are not possible.

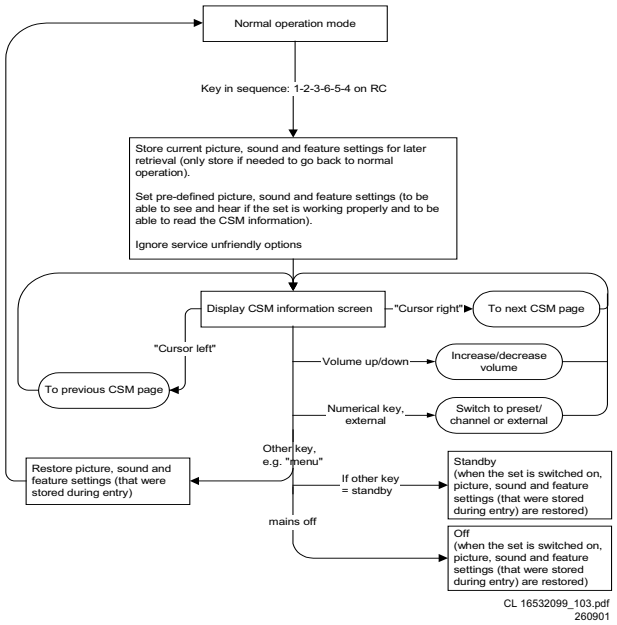


Figure 5-4 CSM Flowchart

How to enter

Use the standard customer RC-transmitter and key in the code 1 2 3 6 5 4.

When CSM is entered, the values of brightness, contrast, etc. are set to 50% (of max. value), and volume is set to 25%, to ensure that you always have a picture and sound.

After switching 'on' the Customer Service Mode, the following screen will appear:

Customer Service Menu 1 ■	
1 Type Nr. AG Code	32FD9944/01S AG02 (example)
2 SW Version OTC	AAAABC X.Y_xxxxx
3 SW Version PW	AAAABC X.Y_xxxxx
4 SW Version EPLD	AAAABC X.Y_xxxxx
5 Code 1	xx xx xx xx xx
6 Code 2	xx xx xx xx xx
7 Volume	xx
8 Brightness	xx
9 Contrast	xx

Customer Service Menu 2 ■	
10 Colour	xx
11 Tint	xx
12 Sharpness	xx
13 Soundmode	xx
14 Source	xx
15 AV Mute	xx

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Figure 5-5 CSM Menu

1. **Type Nr. - AG Code.** Gives the commercial type number of the monitor, e.g. 42FD9954/01S. AG Code is not implemented.
2. **SW Version OTC** (AAAABC-X.Y-xxxxx)
 Note: You will find details of the latest software versions in the chapter 'Software Survey' of the 'Product Survey - Colour Television' publication, which is published four times each year.
 - A = the chassis name (FM23 for 32" displays or FM24 for 42" displays).
 - B = the region (E= Europe, A= Asia Pacific, U= NAFTA, L= LATAM or G = Global).
 - C = the configuration name (B= Basic, E= Enhanced).
 - X = the main software version number.
 - Y = the sub software version number.
 - x = last five digits of 12nc code.
3. **SW Version PW** (AAAABC-X.Y-xxxxx). See description above.
4. **SW Version EPLD** (AAAABC-X.Y-xxxxx). See description above.
5. **Code 1.** Gives the last five errors of the error buffer. The last detected error is displayed at the most left position. The errors are displayed as 2 digit numbers and separated by a space. When less than 10 errors occurred, the rest of the line(s) is empty. In case of no errors, the text 'No Errors' is displayed behind menu item 'Code 1'. See paragraph 5.5 for a description.
6. **Code 2.** Gives the first five errors of the error buffer. The last detected error is displayed at the most left position.
7. **Volume.** Gives the last volume status for the selected source, as set by the customer.
8. **Brightness.** Gives the last brightness status for the selected source, as set by the customer.
9. **Contrast.** Gives the last contrast status for the selected source, as set by the customer.
10. **Colour** (not present in *Basic* configuration). Gives the last colour status for the selected source, as set by the customer.
11. **Tint** (only for *NTSC Enhanced* configuration). Gives the last tint status for the selected source, as set by the customer.
12. **Sharpness.** Gives the last sharpness status for the selected source, as set by the customer.
13. **Source.** Gives the selected source, as set by the customer.
14. **AV Mute.** Indicates if AV Mute is 'on' or 'off'.

How to navigate

Use one of the following methods:

- Switch to the other CSM page with the CURSOR LEFT/ RIGHT keys on the remote control.
- You can increase/decrease volume with the VOLUME UP/ DOWN keys on the remote control.
- You can switch to another source with the NUM/EXT keys on the remote control.

How to exit

Use one of the following methods:

- Press the MENU key of the remote control transmitter.
- Switch the set to 'standby' with the Power switch on the remote control.
- Switch the set 'off' with the Mains power switch.

5.3 Problems and Solving Tips (Related to CSM)

5.3.1 Picture Problems

Note: Below described problems are all related to the monitor settings. The procedures to change the value (or status) of the different settings are described.

Picture too dark or too bright

Increase/decrease the BRIGHTNESS and/or the CONTRAST value when the picture improves after you have switched on the Customer Service Mode. The new value is automatically stored.

White line around picture elements and text

Decrease the SHARPNESS value when the picture improves after you have switched on the Customer Service Mode. The new value is automatically stored.

Snowy picture and/or unstable picture

A scrambled or decoded signal is received.

Black and white picture
Increase the COLOUR value when the picture improves after you have switched on the Customer Service Mode. The new value is automatically stored.

Menu text not sharp enough
Decrease the CONTRAST value when the picture improves after you have switched on the Customer Service Mode. The new value is automatically stored.

5.3.2 Sound Problems

No sound from left or right speaker
Check item 'Volume' in the CSM mode. If value is low, increase the volume level. The new value is automatically stored.

No sound or sound too loud (after channel change/ switching on)
Increase/decrease the VOLUME level when the volume is OK after you switched on the CSM. The new value is automatically stored.

5.4 ComPair

5.4.1 Introduction

ComPair (Computer Aided Repair) is a service tool for Philips Consumer Electronics products. ComPair is a further development on the European DST (Dealer Service Tool), which allows faster and more accurate diagnostics. ComPair has three big advantages:
- ComPair helps you to quickly get an understanding on how to repair the chassis in a short time by guiding you systematically through the repair procedures.
- ComPair allows very detailed diagnostics (on I^2C level) and is therefore capable of accurately indicating problem areas. You do not have to know anything about I^2C commands yourself because ComPair takes care of this.
- ComPair speeds up the repair time since it can automatically communicate with the chassis (when the microprocessor is working) and all repair information is directly available. When ComPair is installed together with the SearchMan electronic manual of the defective chassis, schematics and PWBs are only a mouse click away.

5.4.2 Specifications

ComPair consists of a Windows based faultfinding program, and an RS232 cable between PC and the (defective) product.

The ComPair faultfinding program is able to determine the problem of the defective monitor. ComPair can gather diagnostic information in two ways:
- **Automatic** (by communication with the monitor): ComPair can automatically read out the contents of the entire error buffer. Diagnosis is done on I2C level. ComPair can send and receive commands to the micro controller of the monitor, and so can access the I2C bus of the monitor. In this way, it is possible for ComPair to communicate (read and write) to devices on the I2C busses of the FTV monitor.
- **Manually** (by asking questions to you): Automatic diagnosis is only possible if the micro controller of the monitor is working correctly and only to a certain extend. When this is not the case, ComPair will guide you through the faultfinding tree by asking you questions (e.g. *Does the screen give a picture? Click on the correct answer: YES / NO*) and showing you examples (e.g. *Measure test-point F7 and click on the correct oscillogram you see on the oscilloscope*). You can answer by clicking on a link (e.g. text or a waveform picture) that will bring you to the next step in the faultfinding process.

By a combination of automatic diagnostics and an interactive question / answer procedure, ComPair will enable you to find most problems in a fast and effective way.

Beside fault finding, ComPair provides some additional features like:
- Software upgrading (upload possible to OTC and PW Scaler).
- Emulation of the (European) Dealer Service Tool (DST).
- If both ComPair and SearchMan (Electronic Service Manual) are installed, all the schematics and the PWBs of the set are available by clicking on the appropriate hyperlink.
 Example: Measure the DC-voltage on capacitor C2228 (Schematic/Panel) of the SCAVIO panel. Click on the 'Panel' hyperlink to automatically show the PWB with a highlighted capacitor C2568. Click on the 'Schematic' hyperlink to automatically show the position of the highlighted capacitor.

5.4.3 How to Connect

1. First, install the ComPair Browser software on your PC (read the installation instructions carefully).
2. Connect an RS232 interface cable between a free serial (COM) port on your PC and the RS232 connector on the FM24 plasma monitor.
3. Switch the plasma monitor 'off' and 'on' again (with the Mains switch).
4. Start the ComPair program and follow the instructions.

Note: once the set is in ComPair mode, the front LED will blink red, at a frequency of 0.3 Hz.

5.4.4 How to Order

ComPair order codes:
- Starter kit ComPair software (registration version): 4822 727 21634
- ComPair CD (update): 4822 727 21637
- Starter kit SearchMan software: 4822 727 21635
- SearchMan CD (update): 4822 727 21638

Note: The RS232 cable is not included. It is a standard cable (9p sub-D male-to-female) that can be obtained by a computer store. It is supplied however with the ComPair interface (4822 727 21631), necessary for servicing other Philips TVs.

5.5 Error Buffer

The error code buffer contains all detected errors since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is written at the left side and all other errors shift one position to the right.

5.5.1 How to Read the Error Buffer

Use one of the following methods:
- On screen via the SAM (only if you have a picture). Examples:
 - Errors: **6 0 0 0 0,** error code 6 is the last and only detected error.
 - Errors: **9 6 0 0 0,** error code 6 was first detected and error code 9 is the last detected (newest) error.
- Via the blinking LED procedure (when you have no picture). See paragraph 5.7.
- Via ComPair.

5.5.2 How to Clear the Error Buffer

The error code buffer is cleared in the following cases:
- By activation of the 'Reset error buffer' command in the SAM menu.
- When you transmit the code **0 6 2 5 9 9** with a standard remote control transmitter.

5.5.3 Error Codes

Table 5-1 Error code overview

Error	Device	Description	Item	Dia-gr.
1	TEA6422D	Audio switch (only Enhanced)	7798	SC13
2	MSP3451G	Sound processor	7812	SC14
3	PCF8574-SCAVIO	I/O expander SCAVIO	7540	SC8
4	PCF8591	AD-DA expander	7530	SC8
5	FS6377	Clock generator	7570	SC9
6	PCF8574-PSU	I/O expander PSU	7370	P3
7	24C16 OTC	NVM OTC	7430	SC7
8	24C16 PW	NVM PW	7580	SC9
9	SAA7118	Video decoder (only Enhanced)	7225	SC5
10	AD9887	ADC/TMDS receiver	7170	SC4
11	SDA9400	De-interlacer (only Enhanced)	7280	SC5
12	EP1K30QC	EPLD processor	7656	SC11
13	PDP	I2C error of the PDP		
20	Download comm.	Errors during downloading		
21	CSP comm.	CSP time-out error		
30	PDP	Display HW error		
40	Temperature alarm	Detection of over-temperature		
70	Vs overvoltage	Overvoltage on Vs, Va, +3V3, +5V or a combination	7341	P3
71	Vs undervoltage	Undervoltage on Vs	7308A/B	P3
72	Va undervoltage	Undervoltage on Va	7308C/D	P3
73	+5V undervoltage	Undervoltage on +5V	7330A/B	P3
74	+3V3 undervoltage	Undervoltage on +3V3	7330C/D	P3
75	DC-PROT	Audio amplifier protection	7362	P3
76	TEMP-PSU	Over-temperature in PSU	7366A	P3
77	Protection with reason unknown	No valid protection can be read, but protection is active (PSU)		
78	Protection after several retries	PW Scaler will not start comm. with OTC after several retries.		
9x	OTC	Internal OTC error. Replace.	7383	SC7

Notes:
- In case of non-intermittent faults, clear the error buffer before you begin the repair. This to ensure that old error codes are no longer present.
- If possible, check the entire contents of the error buffer. In some situations, an error code is only the result of another error code and not the actual cause (e.g., a fault in the protection detection circuitry can also lead to a protection).

5.6 The Blinking LED Procedure

Via this procedure, you can make the contents of the error buffer visible via the front LED (orange colour).This is especially useful when there is no picture. When no errors are present, the LED will stay green.

When the SDM is entered, or when code **0 6 2 5 0 0** is entered with the remote control, the LED will blink the contents of the error-buffer.

Error-codes ≥ 10 are shown as follows:
1. n long blinks of 750 ms, which is/are an indication of the decimal digit,
2. a pause of 1.5 s,
3. n short blinks (n = 1-9),
4. when all the error-codes are displayed, the sequence finishes with a LED blink of 3 s,
5. the sequence starts again.

Example of error buffer: **12 9 6 0 0**
After entering SDM:
1. 1 long blink of 750 ms followed by a pause of 1.5 s,
2. 2 short blinks followed by a pause of 3 s,
3. 9 short blinks followed by a pause of 3 s,
4. 6 short blinks followed by a pause of 3 s,
5. 1 long blink of 3 s to finish the sequence,
6. the sequence starts again.

5.7 Protections

You can read the error codes of the error buffer via the service menu (SAM), the blinking LED procedure, or via ComPair. If a fault situation is detected an error code will be generated and if necessary, the set will be put in the protection mode. Blinking of the red LED at a frequency of 5 Hz indicates the protection mode.
In some error cases, the microprocessor does not put the set in the protection mode. The error codes are indicated by an orange front LED.

To get a quick diagnosis the chassis has three service modes implemented:

- The Customer Service Mode (CSM): easy way to read out the status of the set.
- The Service Default Mode (SDM): start-up of the set in a predefined way.
- The Service Alignment Mode (SAM): adjustment of the set via a menu and with the help of test patterns.

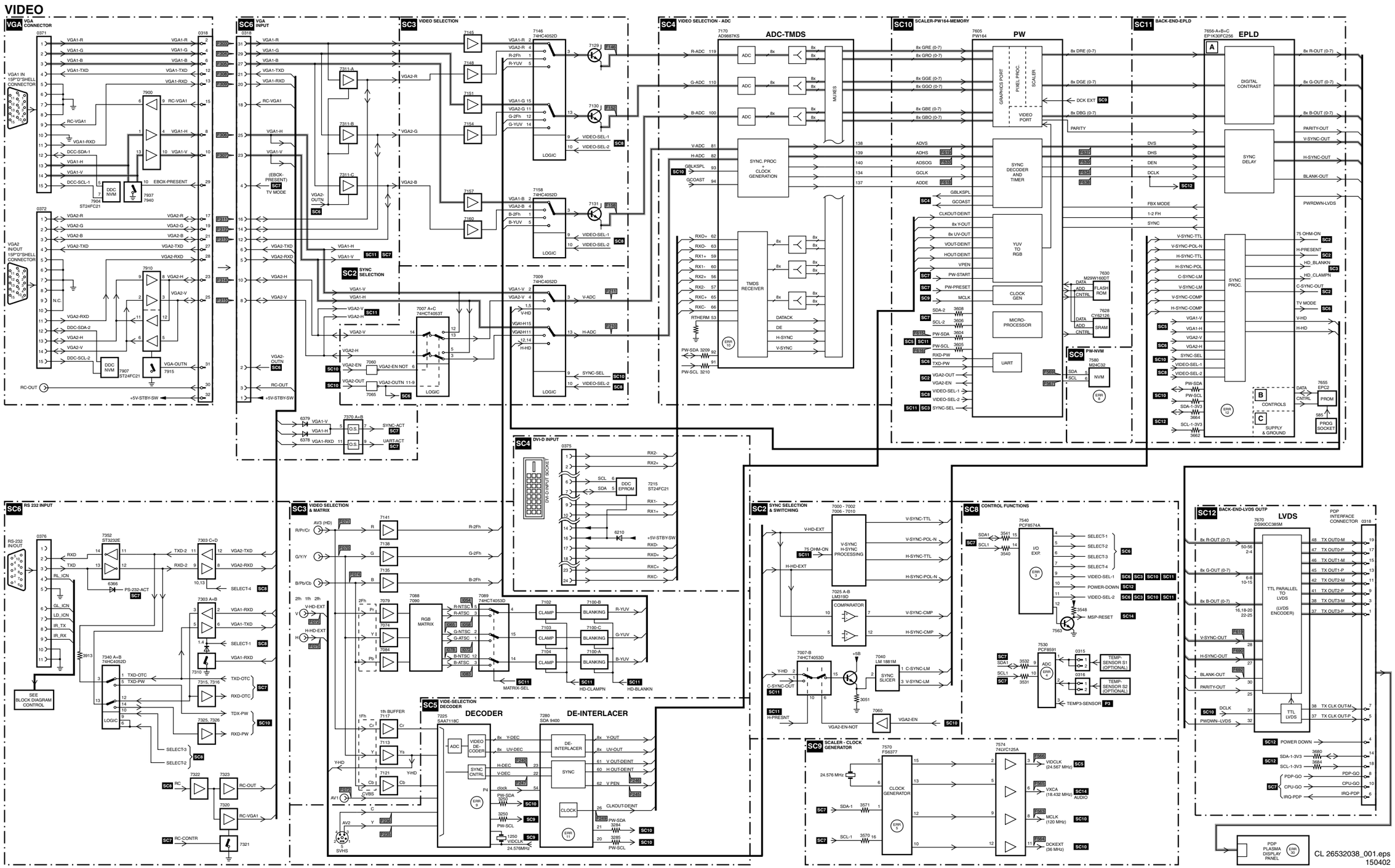
5.8 Repair Tips

Below some failure symptoms are given, followed by a repair tip.

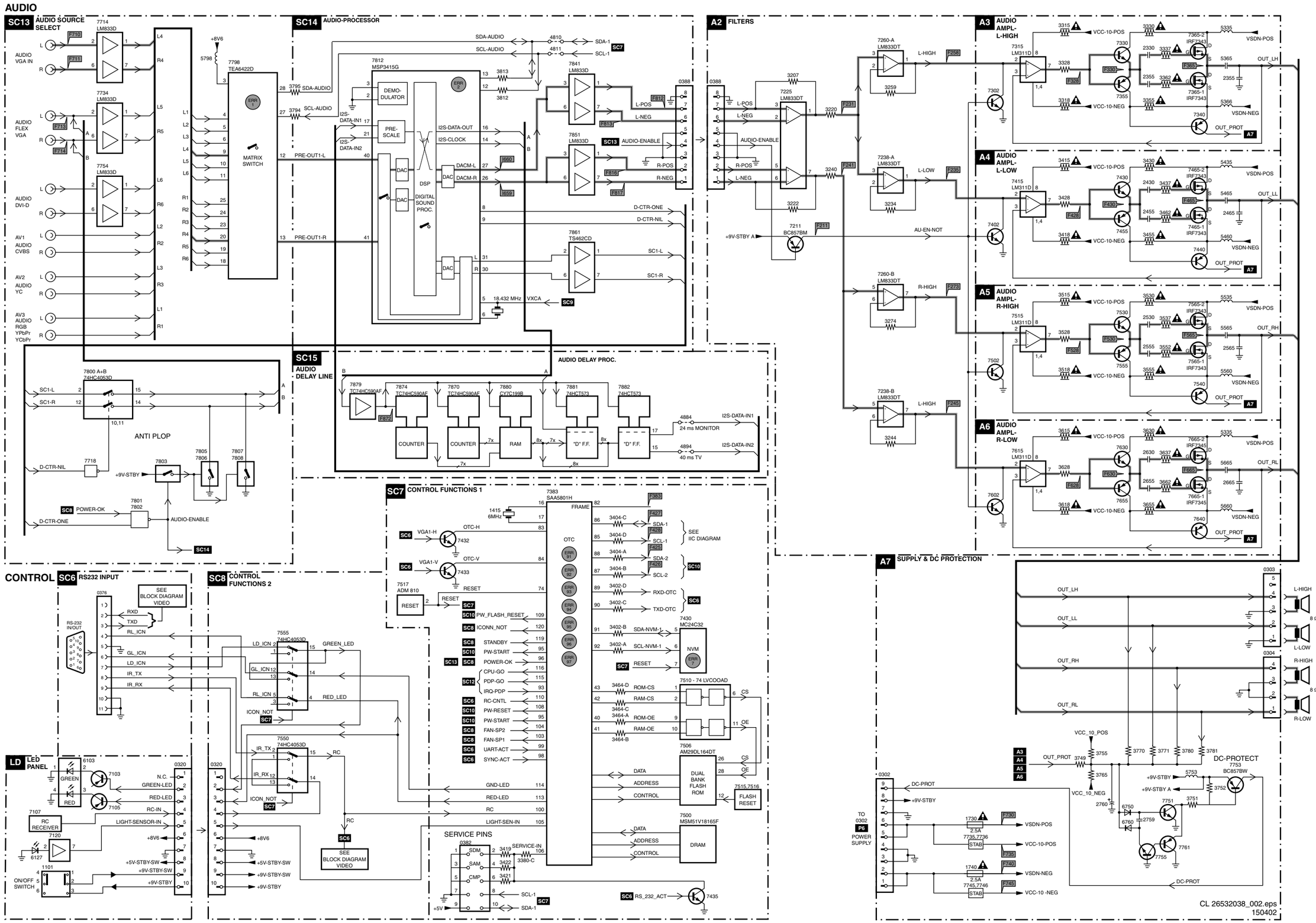
- **Error code indicates an under- or overvoltage protection (errors 70 - 74).** Possible causes:
 - Short-circuit present on PSU.
 - Short-circuit present in PSU load circuit.
 - Converter not functioning (no start-up, or non short-circuit failure).
- **Set starts up, but switches 'off' soon.**
 1. Check the PSU outputs. If no output at all, verify the Power Factor Corrector (= PFC or pre-conditioner) e.g. the relays. When PFC is not switching, the LLC is actively held off.
 2. If PFC works, check VCEGO.
 3. If VCEGO is high, check LLC (VS_UNSW).
 4. If no VS, check pin 15.
 5. If voltage is OK, check pins 12 and 14.
 6. If no pulses, check controller pin 10.
 7. If pin 10 < 1 V, the IC is probably defect.
- **If fuse 1004 (diagram P5) is blown.** Check items 7005 and 7006. If one of them is defect, replace both!
- **If fuse 1400 (diagram P2) is blown.** Check diode bridge 6600, diodes 6606 and 6607 and MOSFET 7610.
- **Set does not react on Remote Control Transmitter.** If the monitor is set (by accident or deliberate) in ICONN-mode (via SAM - Options), and there is no ICONN-Box connected, the RC-signal line to the OTC is interrupted. This can be solved by connecting pin 8 and 9 of the RS232 connector at the rear of the monitor.

6. Block Diagrams, Testpoint Overviews and Wiring Diagram

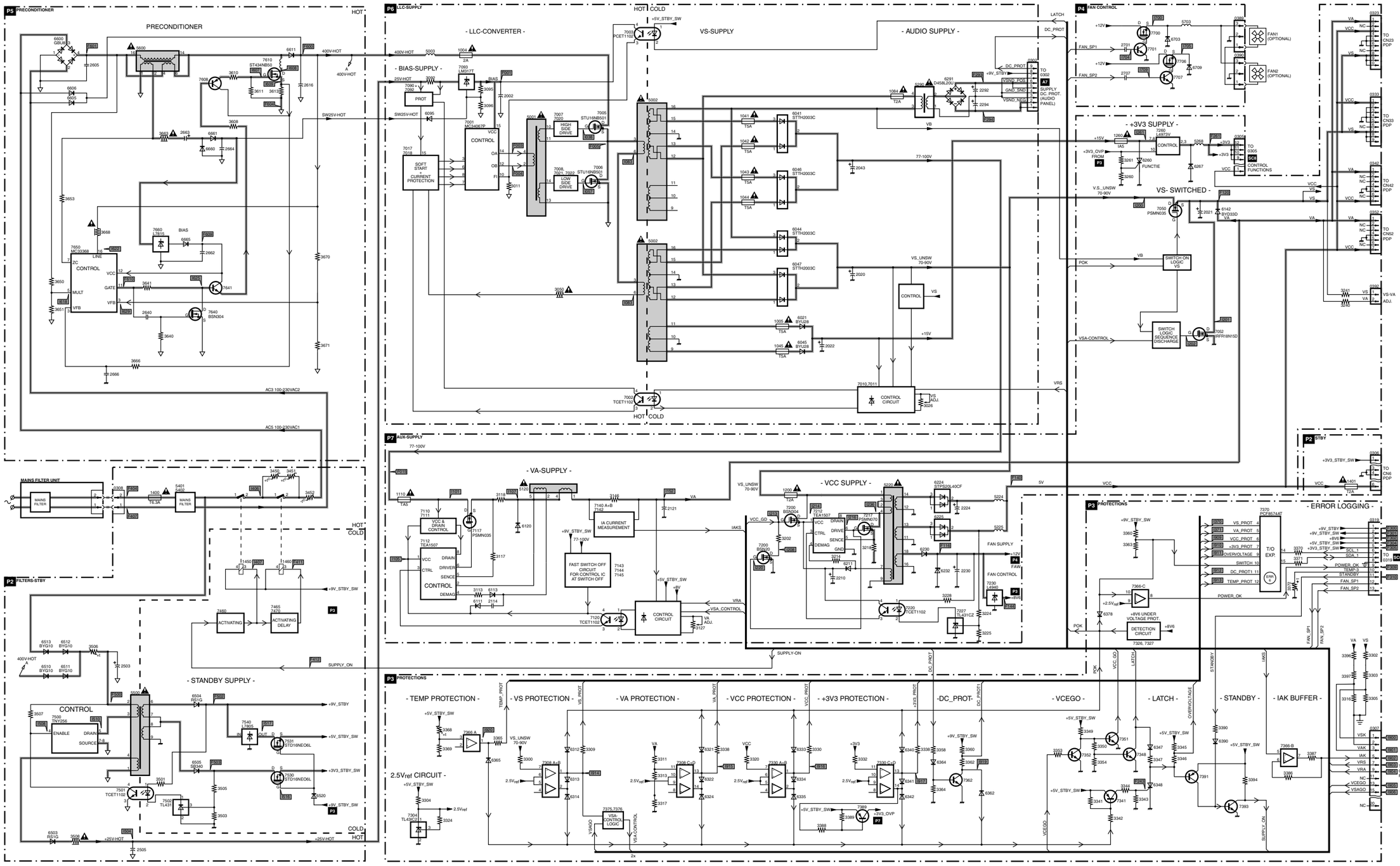
Block Diagram Video



Block Diagram Audio

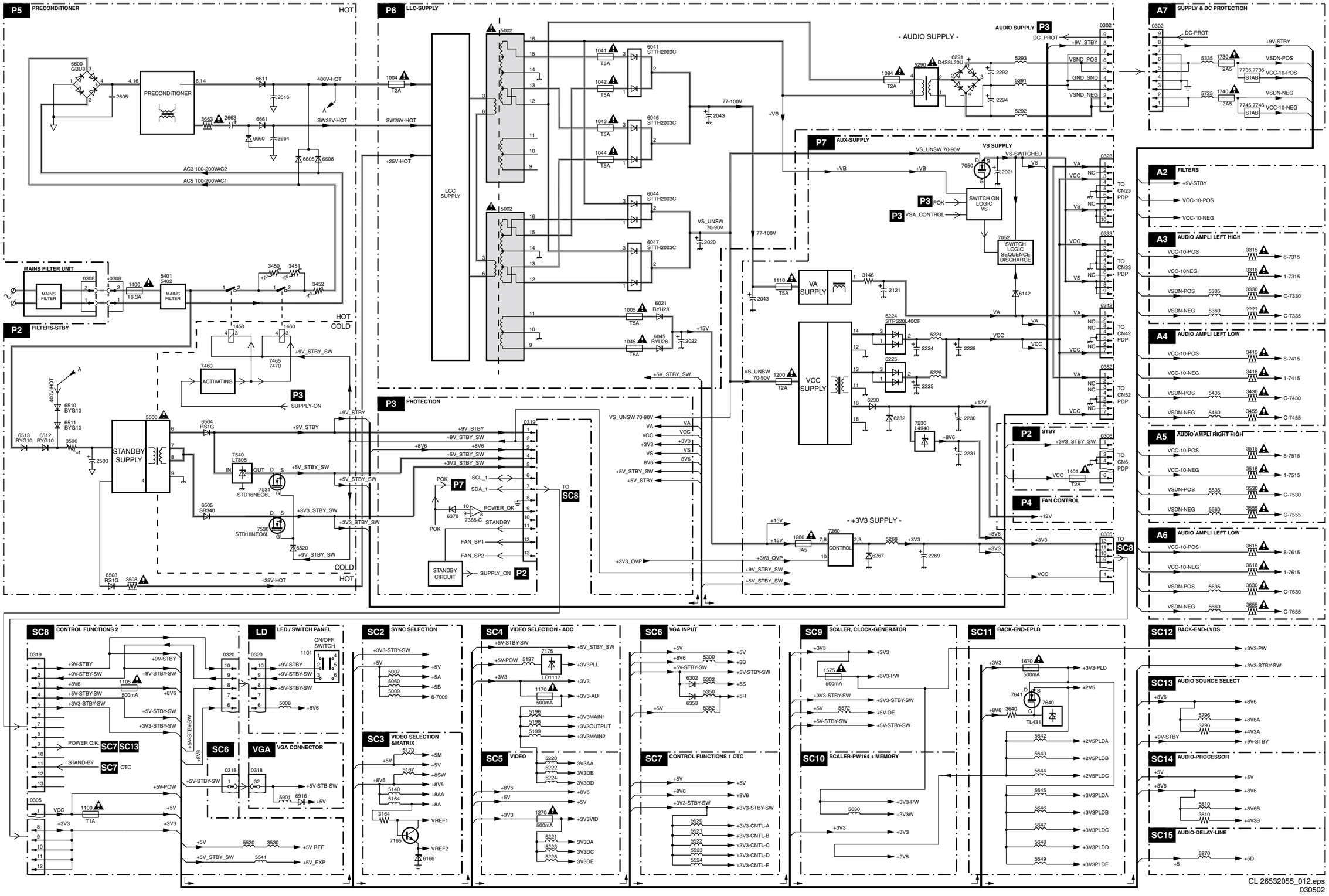


Block Diagram Power Supply



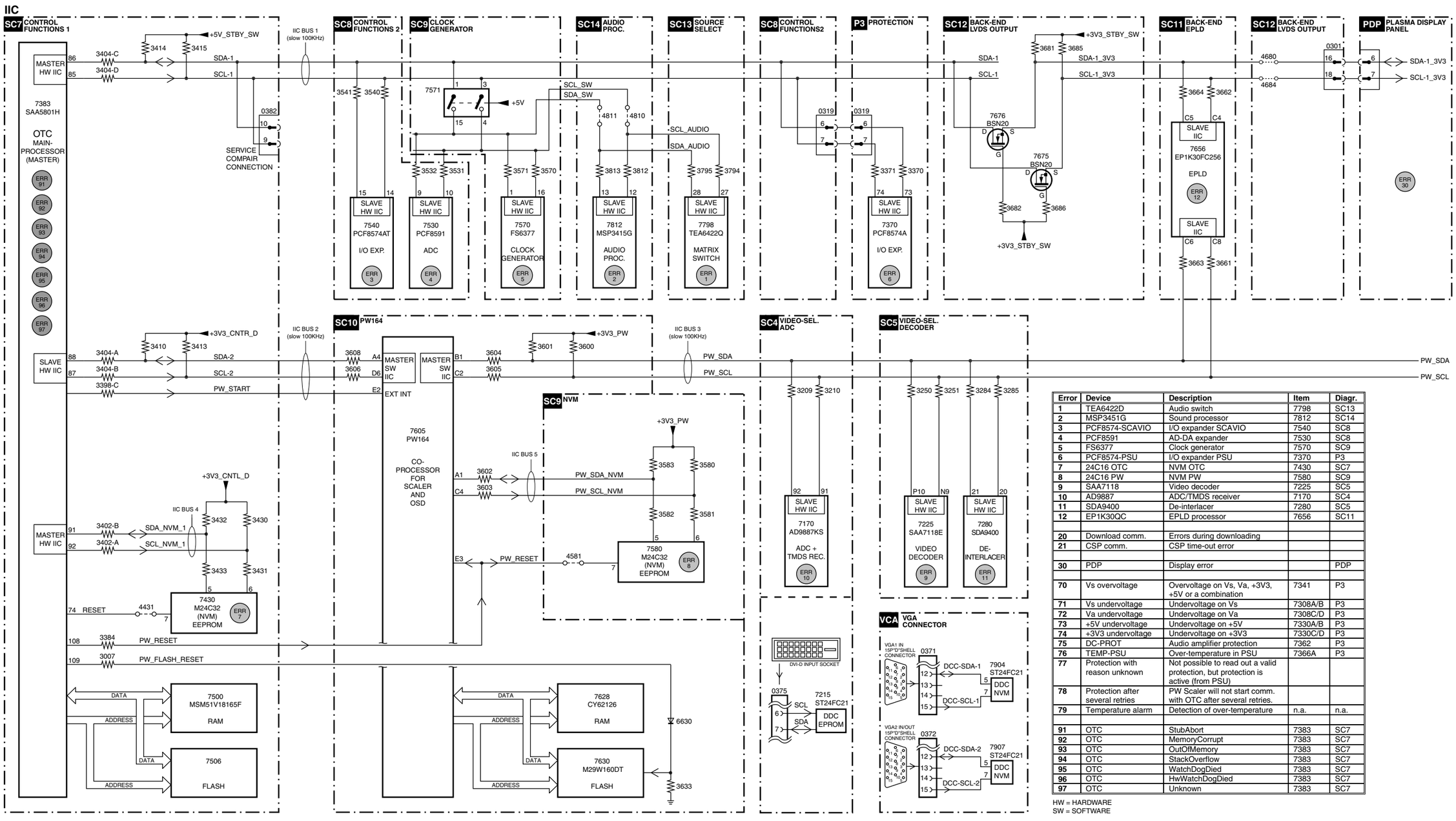
CL 26532055_011.eps
030502

Power Lines Overview



CL 26532055_012.eps
030502

I²C-IC Overview

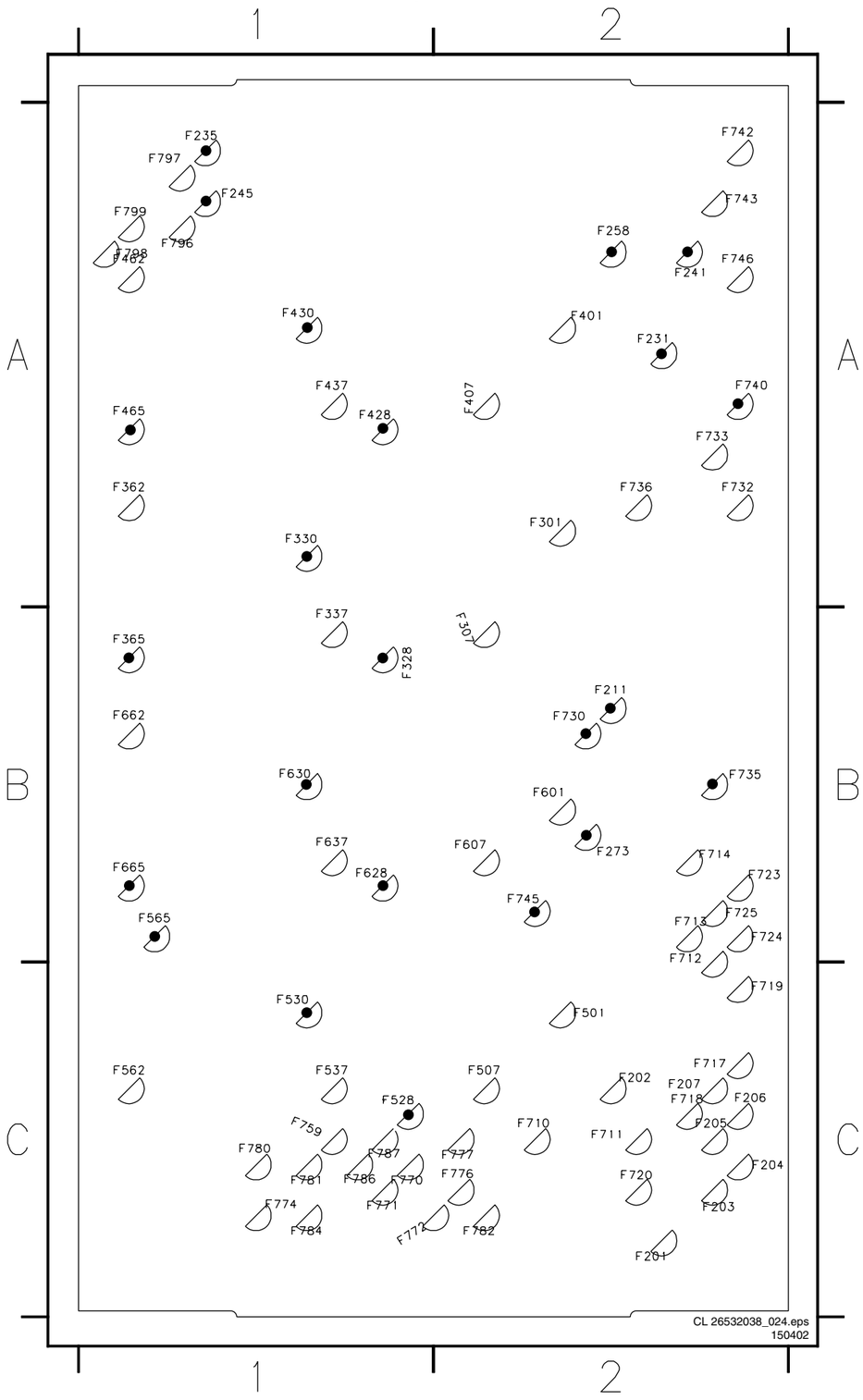


Error	Device	Description	Item	Diagr.
1	TEA6422D	Audio switch	7798	SC13
2	MSP3451G	Sound processor	7812	SC14
3	PCF8574-SCAVIO	I/O expander SCAVIO	7540	SC8
4	PCF8591	AD-DA expander	7530	SC8
5	FS6377	Clock generator	7570	SC9
6	PCF8574-PSU	I/O expander PSU	7370	P3
7	24C16 OTC	NVM OTC	7430	SC7
8	24C16 PW	NVM PW	7580	SC9
9	SAA7118	Video decoder	7225	SC5
10	AD9887	ADC/TMDS receiver	7170	SC4
11	SDA9400	De-interlacer	7280	SC5
12	EP1K30QC	EPLD processor	7656	SC11
20	Download comm.	Errors during downloading		
21	CSP comm.	CSP time-out error		
30	PDP	Display error		PDP
70	Vs overvoltage	Overvoltage on Vs, Va, +3V3, +5V or a combination	7341	P3
71	Vs undervoltage	Undervoltage on Vs	7308A/B	P3
72	Va undervoltage	Undervoltage on Va	7308C/D	P3
73	+5V undervoltage	Undervoltage on +5V	7330A/B	P3
74	+3V3 undervoltage	Undervoltage on +3V3	7330C/D	P3
75	DC-PROT	Audio amplifier protection	7362	P3
76	TEMP-PSU	Over-temperature in PSU	7366A	P3
77	Protection with reason unknown	Not possible to read out a valid protection, but protection is active (from PSU)		
78	Protection after several retries	PW Scaler will not start comm. with OTC after several retries.		
79	Temperature alarm	Detection of over-temperature	n.a.	n.a.
91	OTC	StubAbort	7383	SC7
92	OTC	MemoryCorrupt	7383	SC7
93	OTC	OutOfMemory	7383	SC7
94	OTC	StackOverflow	7383	SC7
95	OTC	WatchDogDied	7383	SC7
96	OTC	HwWatchDogDied	7383	SC7
97	OTC	Unknown	7383	SC7

HW = HARDWARE
SW = SOFTWARE

CL 26532038_005.eps
160402

Testpoint Overview: Audio Amplifier Panel



F201	C2	F718	C2
F201	C2	F718	C2
F202	C2	F719	C2
F202	C2	F719	C2
F203	C2	F720	C2
F203	C2	F720	C2
F204	C2	F723	B2
F204	C2	F723	B2
F205	C2	F724	B2
F205	C2	F724	B2
F206	C2	F725	B2
F206	C2	F725	B2
F207	C2	F730	B2
F207	C2	F730	B2
F211	B2	F732	A2
F211	B2	F732	A2
F231	A2	F733	A2
F231	A2	F733	A2
F235	A1	F735	B2
F235	A1	F735	B2
F241	A2	F736	A2
F241	A2	F736	A2
F245	A1	F740	A2
F245	A1	F740	A2
F258	A2	F742	A2
F258	A2	F742	A2
F273	B2	F743	A2
F273	B2	F743	A2
F301	A2	F745	B2
F301	A2	F745	B2
F307	B2	F746	A2
F307	B2	F746	A2
F328	B1	F759	C1
F328	B1	F759	C1
F330	A1	F770	C1
F330	A1	F770	C1
F365	B1	F771	C1
F365	B1	F771	C1
F401	A2	F772	C1
F401	A2	F772	C1
F407	A2	F774	C1
F407	A2	F774	C1
F428	A1	F776	C2
F428	A1	F776	C2
F430	A1	F777	C2
F430	A1	F777	C2
F465	A1	F780	C1
F465	A1	F780	C1
F501	C2	F781	C1
F501	C2	F781	C1
F507	C2	F782	C2
F507	C2	F782	C2
F528	C1	F784	C1
F528	C1	F784	C1
F530	C1	F786	C1
F530	C1	F786	C1
F565	B1	F787	C1
F565	B1	F787	C1
F601	B2	F796	A1
F601	B2	F796	A1
F607	B2	F797	A1
F607	B2	F797	A1
F628	B1	F798	A1
F628	B1	F798	A1
F630	B1	F799	A1
F630	B1	F799	A1
F665	B1		
F665	B1		
F710	C2		
F710	C2		
F711	C2		
F711	C2		
F712	B2		
F712	B2		
F713	B2		
F713	B2		
F714	B2		
F714	B2		
F717	C2		
F717	C2		

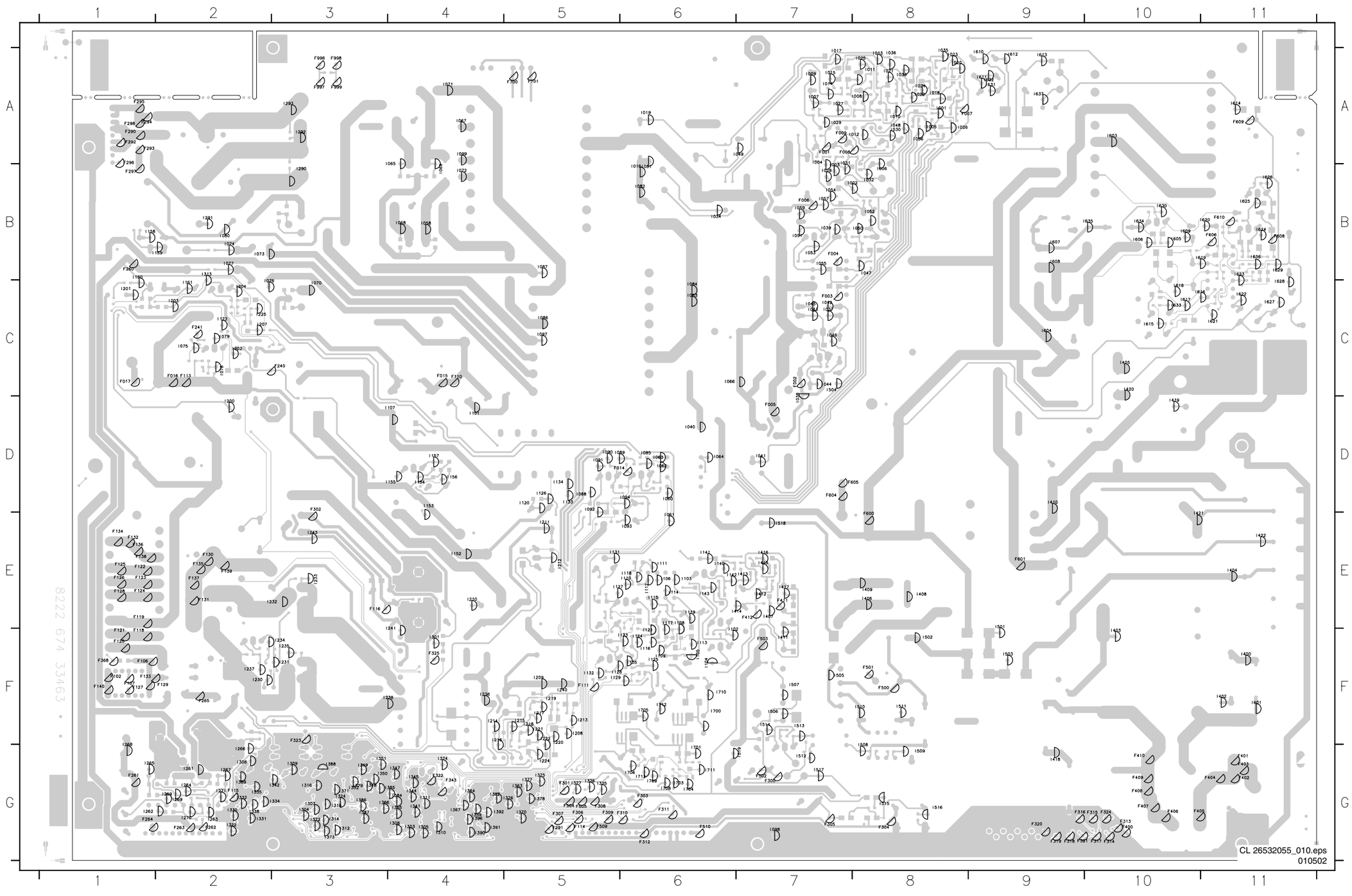
Mapping Testpoints Power Supply

F001	A6	F319	G8	I019	A5	I059	B6	I104	B4	I201	C1	I265	G1	I339	G4	I401	F9	I606	B8	I710	A2
F002	C6	F320	G8	I019	A5	I059	B6	I104	B4	I201	C1	I265	G1	I339	G4	I401	F9	I606	B8	I710	A2
F003	B6	F321	G8	I020	A7	I060	D5	I105	C5	I202	C2	I266	F2	I341	G4	I402	F9	I607	B8	I711	A1
F004	B6	F322	G4	I020	A7	I060	D5	I105	C5	I202	C2	I266	F2	I341	G4	I402	F9	I607	B8	I711	A1
F005	C6	F323	F3	I021	A7	I061	D5	I106	B4	I203	C2	I267	G2	I342	G3	I403	E9	I608	B8	I712	A2
F006	B6	F343	G4	I021	A7	I061	D5	I106	B4	I203	C2	I267	G2	I342	G3	I403	E9	I608	B8	I712	A2
F007	A7	F368	F1	I022	A7	I062	D5	I107	C3	I204	B2	I268	F1	I344	G4	I404	D9	I609	B9	I713	A3
F008	A6	F400	G8	I022	A7	I062	D5	I107	C3	I204	B2	I268	F1	I344	G4	I404	E9	I609	B9	I713	A3
F009	A6	F401	F9	I023	A7	I063	D5	I108	C5	I207	C2	I269	G2	I345	G4	I405	D8	I610	A8	I900	G7
F014	D5	F402	G9	I023	A7	I063	D5	I108	C5	I207	C2	I269	G2	I345	G4	I405	D8	I610	A8	I901	G7
F015	B4	F403	G9	I024	A7	I064	D6	I109	C5	I208	F5	I270	G2	I347	G4	I406	E6	I611	A8	I902	G7
F016	C2	F404	G9	I024	A7	I064	D6	I109	C5	I208	F5	I270	G2	I347	G4	I406	E6	I611	A8	I903	G7
F017	C1	F405	G9	I025	A6	I065	B3	I110	C4	I209	F5	I290	A3	I348	G3	I407	E5	I612	A8	I904	G7
F102	F1	F406	G9	I025	A6	I065	B3	I110	C4	I209	F5	I290	A3	I348	G3	I407	E5	I612	A8	I905	G7
F106	F1	F407	G9	I026	A7	I066	C6	I111	C4	I210	E4	I291	B2	I349	F3	I408	E7	I613	A8	I906	G8
F107	F1	F408	G8	I026	A7	I066	C6	I111	C4	I210	E4	I291	B2	I349	G3	I408	E7	I613	A8		
F110	B4	F409	G8	I027	A6	I067	A4	I112	B4	I211	E5	I292	A3	I350	G3	I409	D9	I614	A9		
F111	D4	F410	F8	I027	A6	I067	A4	I112	B4	I211	E5	I292	A3	I350	G3	I409	D9	I614	A9		
F113	C2	F411	E6	I028	A6	I069	B3	I113	C5	I212	E5	I293	A3	I351	F3	I410	D9	I615	C9		
F114	G5	F412	E5	I028	B6	I069	B3	I113	C5	I212	E5	I293	A3	I351	G3	I410	D9	I615	C9		
F115	G2	F500	F7	I029	A6	I070	B3	I114	B5	I213	F5	I300	E2	I352	G3	I411	E6	I616	C9		
F116	E3	F501	F6	I029	A6	I070	B3	I114	B5	I213	F5	I300	E2	I352	G3	I411	E6	I616	C9		
F118	E1	F502	F5	I030	D6	I071	A4	I115	C4	I214	F4	I301	E4	I362	G4	I412	E5	I617	C9		
F119	E1	F503	E5	I030	D6	I071	A4	I115	C4	I214	F4	I301	E4	I362	G4	I412	E5	I617	C9		
F120	F1	F504	G5	I031	A6	I072	C3	I116	C4	I215	F5	I302	F4	I363	G5	I413	E5	I618	C9		
F121	E1	F505	G5	I031	A6	I072	C3	I116	C4	I215	F5	I302	F4	I363	G5	I413	E5	I618	C9		
F122	E1	F509	G5	I032	A6	I073	B4	I117	C4	I216	F5	I303	G4	I364	G4	I414	E5	I619	C9		
F123	E1	F510	G6	I032	A6	I073	B4	I117	C4	I216	F5	I303	G4	I364	G4	I414	E5	I619	C9		
F124	E1	F600	D6	I033	A7	I074	B2	I118	C4	I217	F5	I304	G2	I365	G4	I415	D5	I620	B9		
F125	E1	F601	E7	I033	A7	I074	B2	I118	C4	I217	F5	I304	G2	I365	G4	I415	E5	I620	B9		
F126	E1	F604	D6	I034	A5	I075	C2	I120	D5	I218	F5	I305	G4	I366	G3	I416	D5	I621	C9		
F127	F1	F605	D6	I034	A5	I075	C2	I120	D5	I218	F5	I305	G4	I366	G3	I416	D5	I621	C9		
F128	E1	F606	C9	I035	A7	I076	B4	I121	C5	I219	F5	I306	G3	I367	G4	I417	E6	I622	C9		
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F133	F2	F701	A1	I037	C6	I078	C2	I123	C5	I221	F5	I308	G4	I371	G3	I501	E7	I624	B9		
F134	E1	F996	A3	I038	C6	I079	C2	I124	C5	I222	F5	I309	G3	I372	G3	I502	E7	I625	B9		
F135	E2	F997	A3	I038	C6	I079	C2	I124	C5	I222	F5	I309	G3	I372	G3	I502	E7	I625	B9		
F136	E1	F998	A3	I039	B6	I080	B2	I125	C4	I224	F5	I310	G4	I373	G3	I503	F7	I626	B9		
F137	E2	F999	A3	I039	B6	I080	B2	I125	C4	I224	F5	I310	G4	I373	G3	I503	F7	I626	B9		
F138	E1	I001	A7	I040	C5	I081	A5	I126	D4	I225	C2	I311	G4	I374	F4	I504	C6	I627	C9		
F139	E2	I001	A7	I040	D5	I081	A5	I126	D4	I225	C2	I311	G4	I374	G4	I504	C6	I627	C9		
F140	F1	I002	B6	I041	C6	I082	B5	I127	C5	I230	F2	I312	G3	I375	G5	I505	F6	I628	C9		
F260	B1	I002	B6	I041	C6	I082	B5	I127	C5	I230	F2	I312	G3	I375	G5	I505	F6	I628	C9		
F261	G1	I003	A6	I042	B6	I083	B5	I128	D5	I231	F2	I313	G3	I376	G4	I506	F6	I629	D9		
F262	G2	I003	A6	I042	C6	I083	B5	I128	D5	I231	F2	I313	G3	I376	G4	I506	F6	I629	D9		
F263	G2	I004	A6	I043	C6	I084	B5	I129	C5	I232	E3	I314	G3	I377	G5	I507	F6	I630	B9		
F264	G1	I004	A6	I043	C6	I084	B5	I129	C5	I232	E3	I314	G3	I377	G5	I507	F6	I630	B9		
F290	A1	I005	A7	I044	C6	I085	D5	I131	D5	I233	E3	I315	G3	I378	G5	I508	F6	I631	A8		
F291	G5	I005	A7	I044	C6	I085	D5	I131	D5	I233	E3	I315	G3	I378	G5	I508	F6	I631	A8		
F292	A1	I006	A7	I045	C6	I088	D5	I132	C4	I234	E2	I316	G3	I380	G3	I509	F7	I632	A8		
F293	A1	I006	A7	I045	C6	I088	D5	I132	D4	I234	E2	I316	G3	I380	G3	I509	F7	I632	A8		
F294	A1	I007	A6	I046	C6	I089	D5	I135	C5	I235	F3	I318	G3	I383	G3	I510	F6	I633	C9		
F295	A1	I007	A6	I046	C6	I089	D5	I135	C5	I235	F3	I318	G3	I383	G3	I510	F6	I633	C9		
F296	A1	I008	A6	I047	B6	I090	D5	I152	E4	I236	F4	I322	G2	I384	G3	I511	F7	I634	B8		
F297	A1	I008	A6	I047	B6	I090	E5	I152	E4	I236	F4	I322	G2	I384	G3	I511	F7	I634	B8		
F298	A1	I009	A6	I048	B7	I091	D5	I153	D4	I237	F2	I324	G3	I385	G3	I512	F6	I635	B8		
F300	F6	I009	A6	I048	B7	I091	D5	I153	D4	I237	F2	I324	G3	I385	G3	I512	F6	I635	B8		
F301	G5	I010	A7	I049	A5	I092	D5	I154	D4	I238	F3	I325	G5	I386	G3	I513	F6	I636	C9		
F302	D3	I010	A7	I049	A5	I092	D5	I154	D4	I238	F3	I325	G5	I386	G3	I513	F6	I636	C9		
F303	G6	I011	A6	I050	B6	I093	D5	I155	D4	I240	F5	I326	G5	I387	G3	I514	F6	I700	A2		
F304	G6	I011	A6	I050	B6	I093	D5	I155	D4	I240	F5	I326	G5	I387	G3	I514	F6	I700	A2		
F305	G6	I012	A6	I051	B6	I094	D5	I156	D4	I241	E4	I327	G5	I388	G3	I515	G6	I701	A2		
F306	G5	I012	A6	I051	B6	I094	D5	I156	D4	I241	E4	I327	G5	I388	G3	I515	G6	I701	A2		
F307	G5	I013	A7	I052	B7	I095	B1	I157	D5	I243	E3	I330	G2	I389	G2	I516	G7	I703	A1		
F308	G5	I013	A7	I052	B7	I095	B1	I157	D5	I243	E3	I330	G2	I389	G2	I516	G7	I703	A1		
F309	G5	I014	A6	I053	B6	I096	D1	I158	B1	I260	F2	I331	G2	I390	G4	I517	F6	I704	A1		
F310	G5	I014	A6	I053	B6	I096	D1	I158	B1	I260	F2	I331	G2	I390	G4	I517	F6	I704	A1		
F311	A1	I015	A6	I054	B6	I098	G7	I159	B1	I261	G2	I332	G2	I391	G4	I518	C6	I705	A2		
F312	G6	I015	A6	I054	B6	I098	G7	I159	B1	I261	G2	I332	G2	I391	G4	I518	C6	I705	A2		
F313	G8	I016	A5	I055	B6	I101	B4	I160	B1	I262	G1	I334	G3	I392	G4	I603	A8	I706	A3		
F314	G8	I016	A5	I055	B6	I101	B4	I160	B1	I262	G1	I334	G3	I392	G4	I603	A8	I706	A3		
F315	G8	I017	A6	I056	A7	I102	B4	I161	B2	I263	G2	I335	G2	I396	G4	I604	C8	I708	A3		
F316	G8	I017	A6	I056	A7	I102	B4	I161	B2	I263	G2	I335	G2	I396	G4	I604	C8	I708	A3		
F317	G8	I018	A7	I057	B6	I103	B5	I200	C2	I264	G2	I338	G2	I400	F9	I605	B9	I709	A3		
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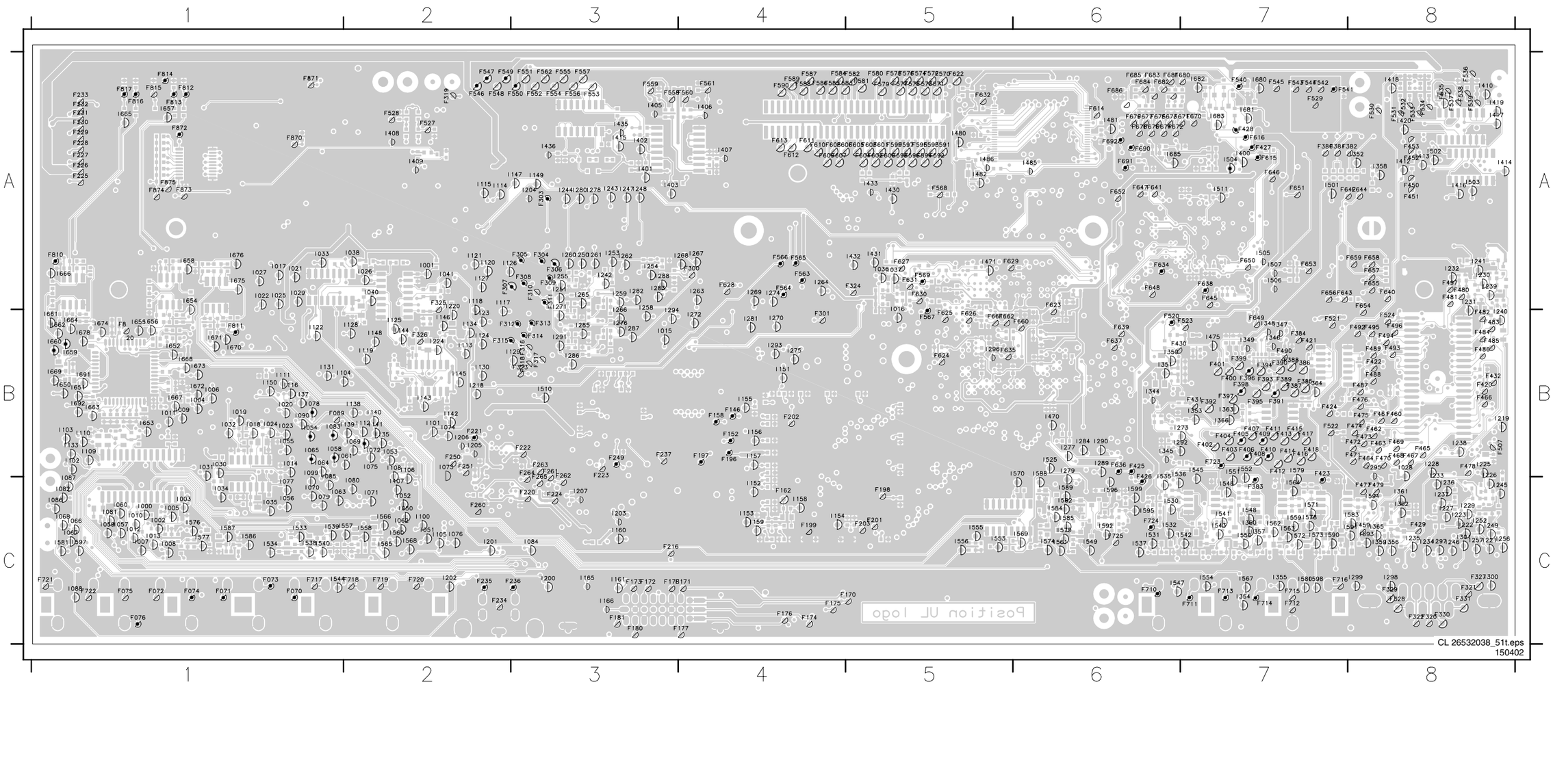
Testpoint Overview: Power Supply

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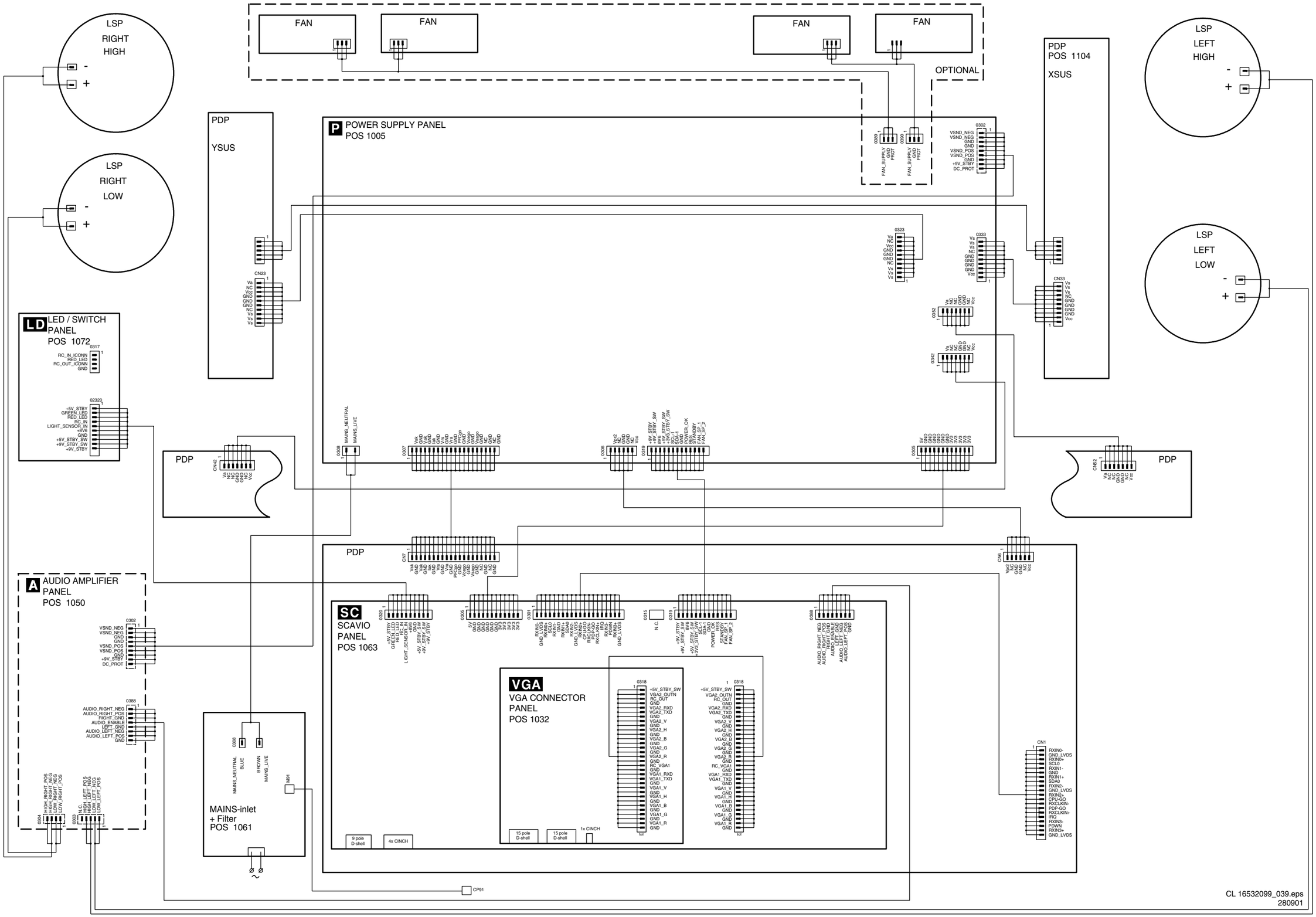
Testpoint Overview: SCAVIO Panel

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F173 C3 F221 B2 F245 B5 F308 A3 F326 B2 F397 B7 F415 B7 F450 A8 F473 B8 F492 B8 F534 A8 F552 A3 F570 A5 F588 A4 F606 A4 F626 B5 F645 A7 F670 A7 F691 A6 F810 A1 I003 C1 I021 A1 I051 C2 I069 B2 I087 C1 I116 B1 I153 C4 I206 B2 I237 C8 I255 A3 I273 B7 I291 B3 I356 C8 I409 A2 I506 A7 I546 C7 I564 C7 I582 C6 I650 B1 I668 B1
F174 C4 F222 B3 F246 B5 F309 A3 F380 A7 F398 B7 F416 B7 F451 A8 F474 B8 F493 B8 F534 A8 F552 A3 F570 A5 F588 A4 F606 A4 F627 A5 F645 A7 F670 A7 F691 A6 F810 A1 I003 C1 I021 A1 I051 C2 I069 B2 I087 C1 I116 B1 I153 C4 I206 B2 I237 C8 I255 A3 I273 B7 I291 B3 I356 C8 I409 A2 I506 A7 I546 C7 I564 C7 I582 C6 I650 B1 I668 B1
F174 C4 F222 B3 F247 B5 F309 A3 F380 A7 F398 B7 F416 B7 F451 A8 F474 B8 F493 B8 F535 A8 F553 A3 F571 A5 F589 A4 F607 A4 F627 A5 F646 A7 F671 A7 F692 A6 F811 B1 I004 B1 I022 A1 I052 C2 I070 C1 I088 C1 I117 A2 I154 C4 I220 B2 I238 B8 I256 C8 I274 A4 I292 B6 I357 C7 I430 A5 I507 A7 I547 C7 I565 C2 I583 C8 I651 B1 I669 B1
F175 C4 F223 B3 F249 B3 F310 A3 F381 A7 F399 B7 F417 B7 F452 A8 F475 B8 F494 B8 F535 A8 F553 A3 F571 A5 F589 A4 F607 A4 F628 A4 F646 A7 F671 A7 F692 A6 F811 B1 I004 B1 I022 A1 I052 C2 I070 C1 I088 C1 I117 B2 I154 C4 I220 B2 I238 B8 I256 C8 I274 A4 I292 B6 I357 C7 I430 A5 I507 A7 I547 C7 I565 C2 I583 C8 I651 B1 I669 B1
F175 C4 F223 B3 F249 B3 F310 A3 F381 A7 F399 B7 F417 B7 F452 A8 F475 B8 F494 B8 F536 A8 F554 A3 F572 A5 F590 A4 F608 A4 F628 A4 F647 A6 F672 A6 F710 C6 F812 A1 I005 C1 I023 B1 I053 B2 I071 C2 I100 C2 I118 A2 I155 B4 I221 C8 I239 A8 I257 C8 I275 B4 I293 B4 I358 A8 I431 A5 I530 C6 I548 C7 I566 C2 I584 C6 I652 B1 I670 B1
F176 C4 F224 C3 F250 B2 F311 A3 F382 A8 F400 B7 F418 B7 F453 A8 F476 B8 F495 B8 F536 A8 F554 A3 F572 A5 F590 A4 F608 A4 F629 A5 F647 A6 F672 A6 F710 C6 F812 A1 I005 C1 I023 B1 I053 B2 I071 C2 I100 C2 I118 B2 I155 B4 I221 C8 I239 A8 I257 C8 I275 B4 I293 B4 I358 A8 I431 A5 I530 C6 I548 C7 I566 C2 I584 C6 I652 B1 I670 B1
F176 C4 F224 C3 F250 B2 F311 A3 F382 A8 F400 B7 F418 B7 F453 A8 F476 B8 F495 B8 F537 A8 F555 A3 F573 A5 F591 A5 F609 A4 F629 A5 F648 A6 F673 A6 F711 C7 F813 A1 I006 B1 I024 B1 I054 B1 I072 B2 I101 B2 I119 B2 I156 B4 I222 C8 I240 B8 I258 A3 I276 B3 I294 B3 I359 C8 I432 A5 I531 C6 I549 C6 I567 C7 I585 C6 I653 B1 I671 B1



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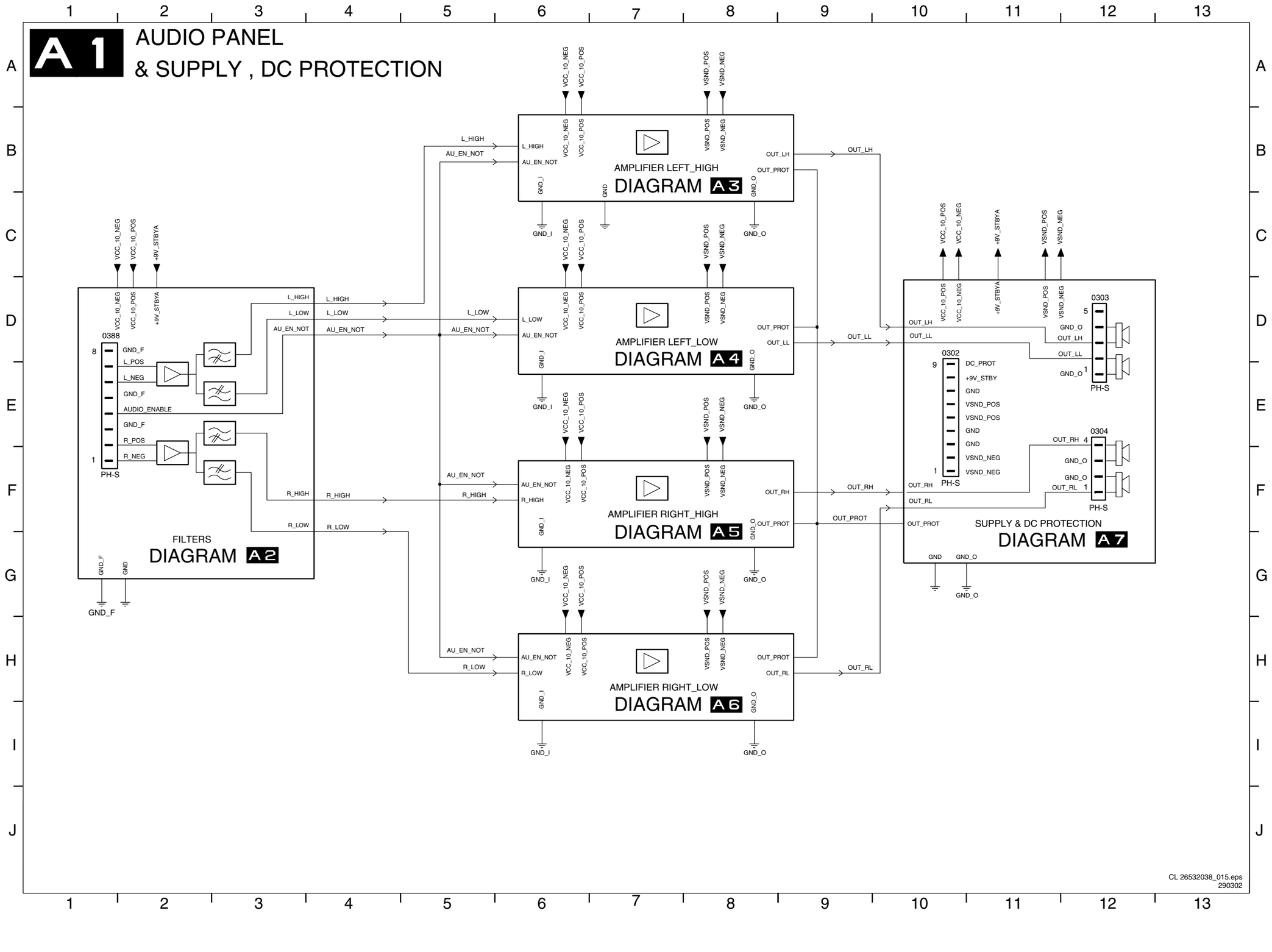
Wiring Diagram



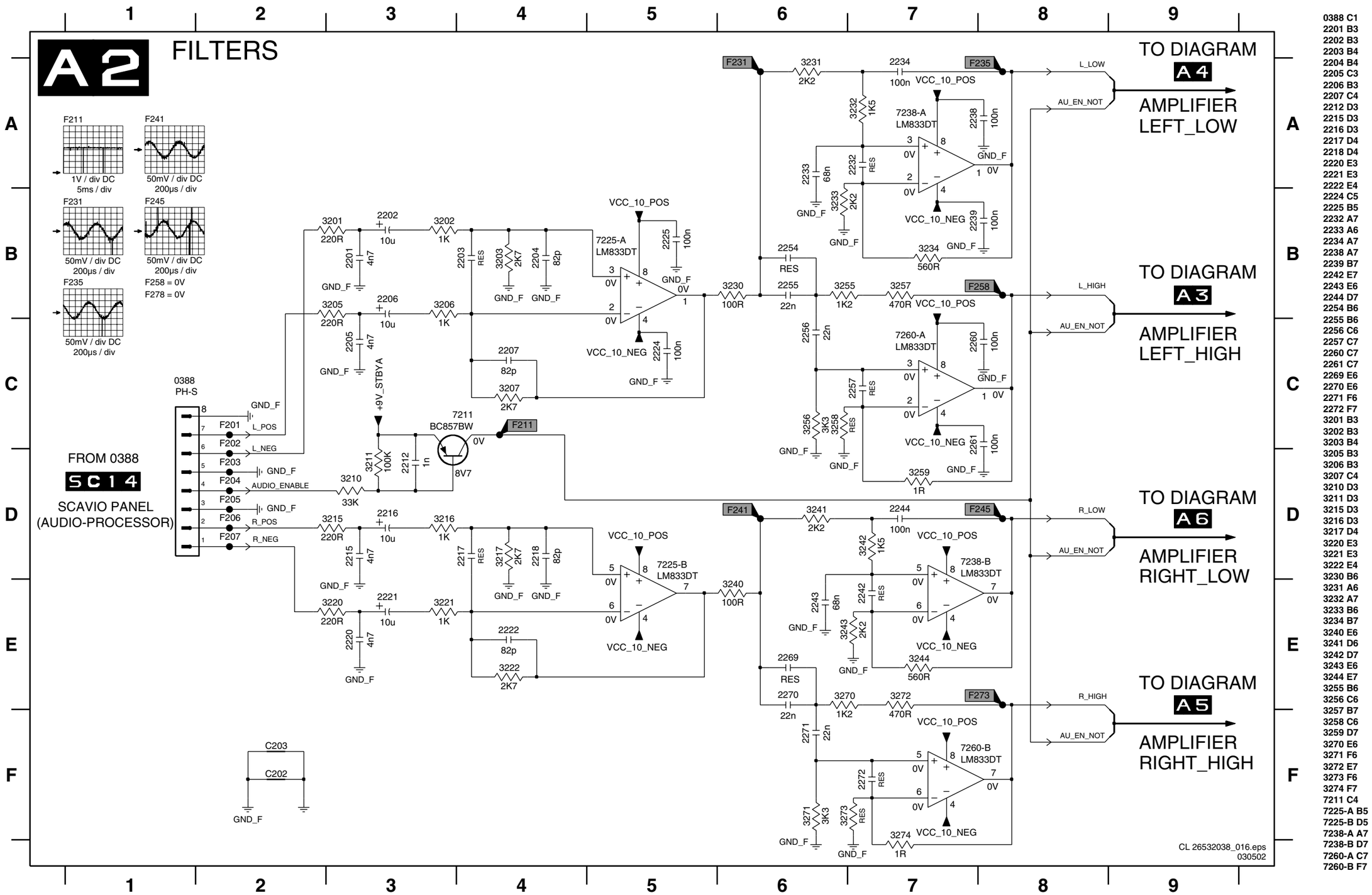
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7. Electrical Diagrams and PWB Layouts

Audio Panel & Supply: DC Protection



Audio Panel & Supply: Filters



0388 C1
2201 B3
2202 B3
2203 B4
2204 B4
2205 C3
2206 B3
2207 C4
2212 D3
2215 D3
2216 D3
2217 D4
2218 D4
2220 E3
2221 E3
2222 E4
2224 C5
2225 B5
2232 A7
2233 A6
2234 A7
2238 A7
2239 B7
2242 E7
2243 E6
2244 D7
2254 B6
2255 B6
2256 C6
2257 C7
2260 C7
2261 C7
2269 E6
2270 E6
2271 F6
2272 F7
3201 B3
3202 B3
3203 B4
3205 B3
3206 B3
3207 C4
3210 D3
3211 D3
3215 D3
3216 D3
3217 D4
3220 E3
3221 E3
3222 E4
3230 B6
3231 A6
3232 A7
3233 B6
3234 B7
3240 E6
3241 D6
3242 D7
3243 E6
3244 E7
3255 B6
3256 C6
3257 B7
3258 C6
3259 D7
3270 E6
3271 F6
3272 E7
3273 F6
3274 F7
7211 C4
7225-A B5
7225-B D5
7238-A A7
7238-B D7
7260-A C7
7260-B F7

C202 F2
C203 F2
F201 C2
F202 C2
F203 D2
F204 D2
F205 D2
F206 D2
F207 D2
F211 C4
F231 A6
F235 A8
F241 D6
F245 D8
F258 B8
F273 E8

Audio Panel & Supply: Left High

2309 D4	2316 C5	2330 C7	2340 E7	2360 E8	3301 C3	3304 D2	3308 C4	3311 C4	3325 B5	3330 B6	3340 D6	3362 D8	5365 C9	6335 C7	6359 E7	7303 C3	7340 D7	7365-2 C8	F301 C3	F330 C7	F365 C8
2310 B3	2318 D5	2334 B8	2355 D7	2365 C9	3302 D3	3306 C3	3309 D4	3315 B5	3327 C5	3336 B8	3355 E6	5335 B8	6328 C6	6355 D6	6360 D7	7315 C4	7355 D6	C301 E3	F307 C4	F337 C8	
2315 C4	2319 D5	2335 B8	2359 E8	2366 C9	3303 C2	3307 C4	3310 B3	3318 D5	3328 B6	3337 C8	3361 E8	5360 E8	6334 B7	6356 E6	7302 D3	7330 C6	7365-1 D8	C302 E3	F328 B6	F362 D8	

A3 AUDIO AMPLIFIER LEFT HIGH

F328
2V / div DC
1µs / div

F330
2V / div DC
1µs / div

F365
5V / div DC
1µs / div

FROM DIAGRAM A2
FILTERS

TO DIAGRAM A7
SUPPLY & DC PROTECTION

VSND_POS
VCC_10_POS
VCC_10_NEG
VSND_NEG
L_HIGH
AU_EN_NOT
OUT_LH
OUT_PROT

2310 82p
3310 82K
3315 10R
3330 10R
3307 100K
3308 100K
2315 1u
2316 100n
3325 2K2
3328 1K
F328
3327 2K2
6328 BAS316
3303 1K
3301 1K
F301
7303 BC847BW
3304 4K7
3306 8K2
7302 BC847BW
3302 4K7
3311 1R
F307
7315 LM311D
BAL
STRIBAL
V+
V-
GND
9V7
-9V8
0V
-2V
2309 1n5
3309 180R
3318 10R
2318 100n
2319 1u
14V2
7330 BC817-25
-0V04
F330
7355 BC807-25
-14V2
7340 BC847BW
3340 10K
3355 10R
2340 10n
6355 BZX384-C4V7
6356 BZX384-C4V7
6334 BZX384-C4V7
6335 BZX384-C4V7
6360 BZX384-C4V7
6359 BZX384-C4V7
3336 4M7
2334 220u
2335 100n
F337
7365-2 IRF7343
3337 10R
14V3
2330 100n
2355 100n
7365-1 IRF7343
3362 10R
-14V4
F362
F365
0V
5365 33u
2365 220n
2366 220n
2360 220u
2359 100n
5360 100MHZ
5335 100MHZ
C302
C301
GND_I
GND_O

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Audio Panel & Supply: Left Low

2409 D3	2416 C4	2430 C7	2440 E6	2460 E8	3401 C3	3404 D2	3408 C4	3411 C3	3425 B5	3430 B6	3440 D6	3462 D8	5465 C9	6435 C7	6459 E7	7403 C2	7440 D7	7465-2 C8	F428 B6	F462 D8
2410 B3	2418 D5	2434 B8	2455 D7	2465 D9	3402 D2	3406 C3	3409 D4	3415 B4	3427 C5	3436 B7	3455 E6	5435 B8	6428 C5	6455 D6	6460 D7	7415 C4	7455 D6	7465-1 D8	F430 C6	F465 C8
2415 C4	2419 D5	2435 B8	2459 E8	2466 D9	3403 C2	3407 C3	3410 B3	3418 D4	3428 B5	3437 C8	3461 E7	5460 E8	6434 B7	6456 E6	7402 D3	7430 C6	7465-1 D8	F407 D4	F437 C8	

A4 AUDIO AMPLIFIER LEFT LOW

F428
2V / div DC
1µs / div

F430
2V / div DC
1µs / div

F465
5V / div DC
1µs / div

FROM DIAGRAM A2
FILTERS

L_LOW
AU_EN_NOT
7403 BC847BW
7402 BC847BW
3403 1K
3401 1K
F401
3404 4K7
3402 4K7
3406 8K2
F407
0V
3407 100K
3408 100K
3410 82K
2410 82p
3411 15K
2409 1n5
3409 180R
2415 1u
2416 100n
3415 10R
3425 2K2
3427 2K2
3428 1K
6428 BAS316
7415 LM311D
BAL
STRIBAL
V+
GND
V-
9V7
-2V
-9V8
3418 10R
2418 100n
2419 1u
VCC_10_POS
VCC_10_NEG
GND_I
3430 10R
14V2
7430 BC817-25
-0V04
F430
7455 BC807-25
-14V2
7440 BC847BW
3440 10K
3455 10R
2440 10n
6455 BZX384-C4V7
6456 BZX384-C4V7
VSND_POS
5435 100MHZ
6434 BZX384-C4V7
6435 BZX384-C4V7
3436 4M7
2434 220u
2435 100n
GND_O
F437
7465-2 IRF7343
3437 10R
14V3
3
4
5 6
F465
0V
5465 33u
OUT_LL
2465 220n
2466 220n
OUT_PROT
7465-1 IRF7343
3462 10R
7 8
2 1
-14V4
F462
6460 BZX384-C4V7
6459 BZX384-C4V7
3461 4M7
2430 100n
2455 100n
2460 220u
2459 100n
5460 100MHZ
VSND_NEG

TO DIAGRAM A7
SUPPLY & DC PROTECTION

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Audio Panel & Supply: Right High

2509 D3	2516 C4	2530 C7	2540 E6	2560 E8	3501 C2	3504 D2	3508 C4	3511 C3	3525 B5	3530 B6	3540 D6	3562 D8	5565 C9	6535 C7	6559 E7	7503 C2	7540 D7	7565-2 C8	F528 B6	F562 D8
2510 B3	2518 D5	2534 B8	2555 D7	2565 D9	3502 D2	3506 D3	3509 D4	3515 B4	3527 C5	3536 B7	3555 E6	5535 B8	6528 C5	6555 D6	6560 D7	7515 C4	7555 D6	7565-1 D8	F530 C6	F565 C8
2515 C4	2519 D5	2535 B8	2559 E8	2566 D9	3503 C2	3507 C3	3510 B3	3518 D4	3528 B5	3537 C8	3561 E7	5560 E8	6534 B7	6556 E6	7502 D3	7530 C6	7565-1 D8	F507 D4	F537 C8	

A5 AUDIO AMPLIFIER RIGHT HIGH

F528
2V / div DC
1µs / div

F530
2V / div DC
1µs / div

F565
5V / div DC
1µs / div

FROM DIAGRAM A2
FILTERS

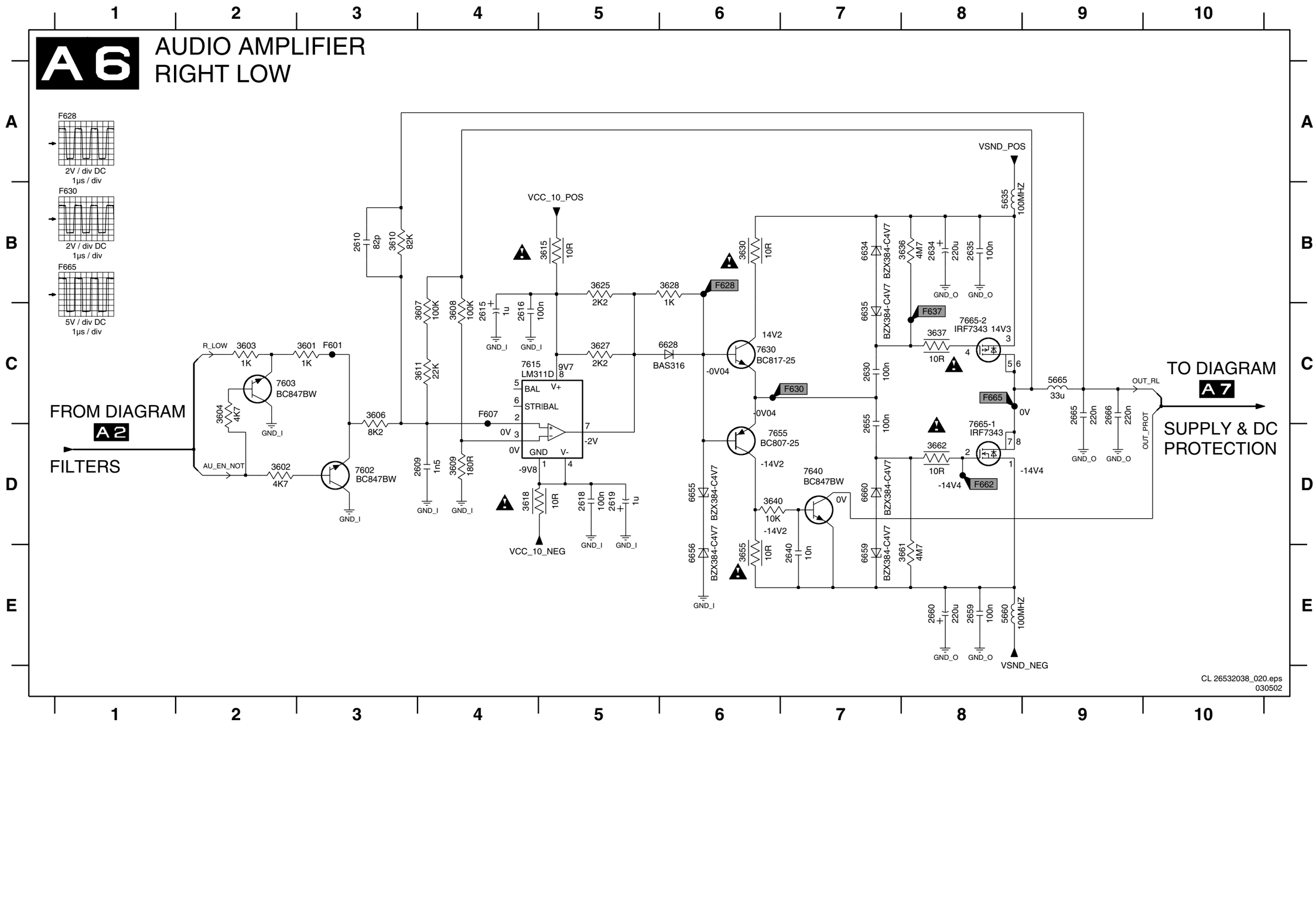
TO DIAGRAM A7
SUPPLY & DC PROTECTION

R_HIGH 3503 1K 3501 1K F501
7503 BC847BW
3504 4K7
AU_EN_NOT 3502 4K7
7502 BC847BW
3506 8K2
3507 100K
3508 100K
3511 6K8
2509 1n5
3509 180R
2510 82p
3510 82K
2515 1u
2516 100n
7515 LM311D 9V7
BAL V+ STRIBAL GND V-
F507 0V
-9V8
-2V
3515 10R
VCC_10_POS
VCC_10_NEG
3518 10R
2518 100n
2519 1u
3525 2K2
3527 2K2
3528 1K
F528
6528 BAS316
3530 10R
14V2
7530 BC817-25
-0V04
F530
7555 BC807-25
-14V2
7540 BC847BW
0V
3540 10K
3555 10R
2540 10n
6555 BZX384-C4V7
6556 BZX384-C4V7
6534 BZX384-C4V7
6535 BZX384-C4V7
6560 BZX384-C4V7
6559 BZX384-C4V7
3536 4M7
3561 4M7
2534 220u
2535 100n
2530 100n
2555 100n
2560 220u
2559 100n
VSND_POS
5535 100MHZ
VSND_NEG
5560 100MHZ
F537
7565-2 IRF7343 14V3
3537 10R
7565-1 IRF7343
3562 10R
-14V4
F562
F565 0V
5565 33u
2565 220n
2566 220n
OUT_RH
OUT_PROT
GND_I
GND_O

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030502

Audio Panel & Supply: Right Low

2609 D4	2616 C4	2630 C7	2640 E7	2660 E8	3601 C3	3604 C2	3608 C4	3611 C4	3625 B5	3630 B6	3640 D6	3662 D8	5665 C9	6635 C7	6659 E7	7603 C2	7640 D7	7665-2 C8	F628 B6	F662 D8
2610 B3	2618 D5	2634 B8	2655 C7	2665 C9	3602 D2	3606 C3	3609 D4	3615 B5	3627 C5	3636 B8	3655 E6	5635 B8	6628 C6	6655 D6	6660 D7	7615 C4	7655 D6	7601 C3	F630 C7	F665 C8
2615 C4	2619 D5	2635 B8	2659 E8	2666 C9	3603 C2	3607 C4	3610 B3	3618 D4	3628 B6	3637 C8	3661 E8	5660 E8	6634 B7	6656 E6	7602 D3	7630 C6	7665-1 D8	F607 C4	F637 C8	



Audio Panel & Supply: Supply and DC Protection

A7 SUPPLY & DC PROTECTION

F730 = 14V4
F735 = 9V
F740 = -14V4
F745 = -8V8

FROM DIAGRAM A3 AUDIO AMPLIFIER LEFT HIGH
FROM DIAGRAM A4 AUDIO AMPLIFIER LEFT LOW
FROM DIAGRAM A5 AUDIO AMPLIFIER RIGHT HIGH
FROM DIAGRAM A6 AUDIO AMPLIFIER RIGHT LOW

FROM 0302
PS6
POWER SUPPLY

0302 PH-S
F710 DC_PROT
F711 +9V_STBY
F712 F713 F714 5714 100MHZ
F717 F718 F719 5719 F720 100MHZ
F723 F724 F725 5725 100MHZ

SUPPLY

1730 T2.5AL 250V
F730 VSND_POS
F735 VCC_10_POS
7735 BC869
2730 220u 2732 220u
3732 2K7
F736 13V7
F732 9V8
7736 BC847BW
6732 BZX384-C10
F733 9V2
3733 1K
2734 1u

1740 T2.5AL 250V
F740 VSND_NEG
7745 BC868
2740 220u 2742 220u
3742 2K7
F746 -13V7
F742 -9V7
7746 BC857BW
6742 BZX384-C10
F743 -9V2
3743 1K
2744 1u

RES=RESERVED
F796 F797 3799 F798 F799 RES

C704
C703
C702
GND_O

0305 SHIELDING 3.3
0390 SHIELDING 3.3
0391 SHIELDING 3.3
2799 10n

DC PROTECTION

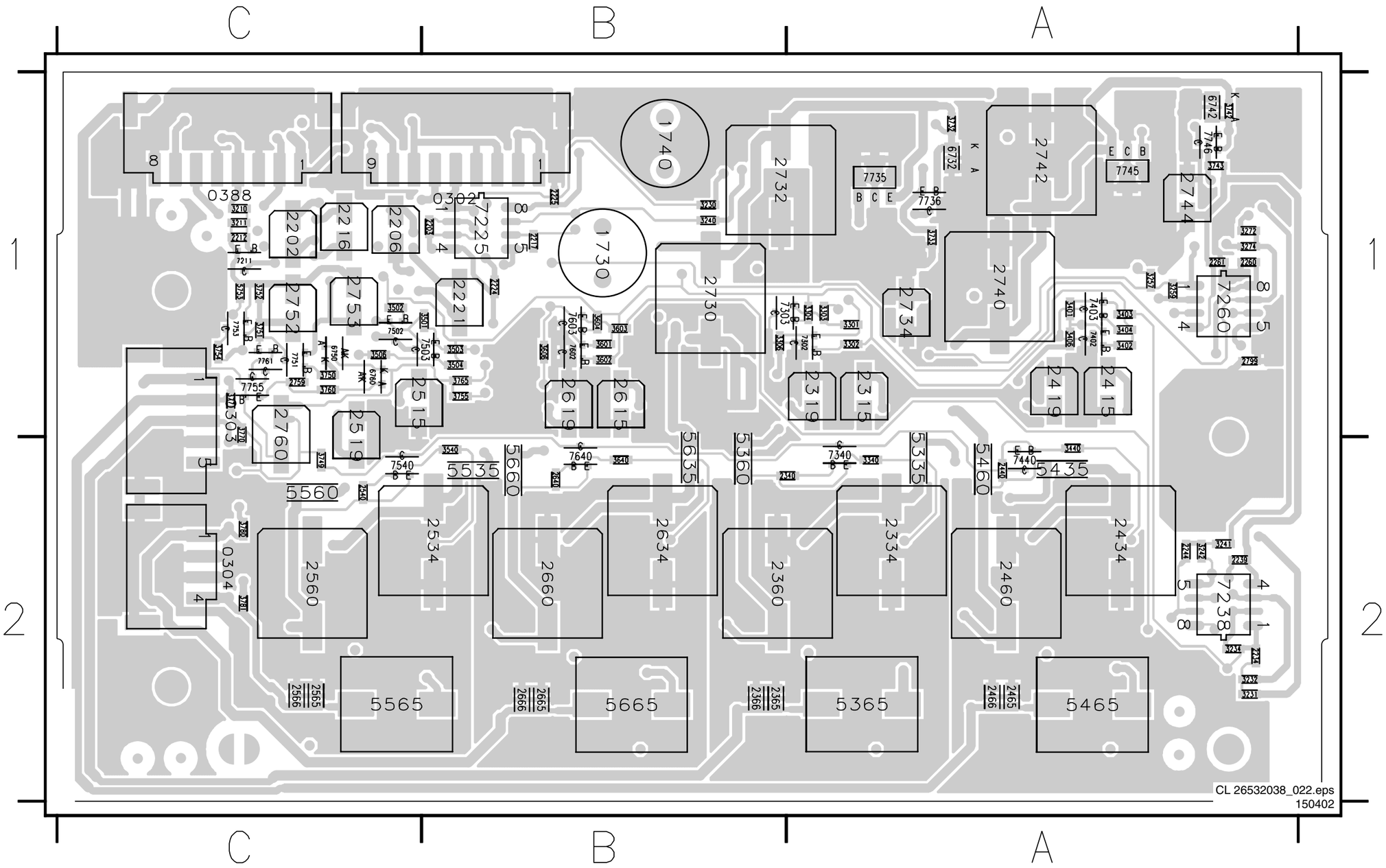
0303 PH-S
OUT_LH
OUT_PROT
OUT_LL
F771 F770
F776 F777
GND_O
F772
F774
NC.
LEFT HIGH
8 Ohm
LEFT LOW
3770 100K
3771 100K
2771 1n
2770 1n
2760 22u
3749 10K
F759
VCC_10_POS
3755 100K
VCC_10_NEG
3765 100K
6750 BAV99W
6760 BAV99W
3750 470R
3760 470R
2759 1n
7751 BC847BW
7755 BC847BW
7761 BC857BW
+9V_STBY
+9V_STBYA
5753 100MHZ
2753 10u
3752 47K
2752 10u
3751 47K
8V7
7753 BC857BW
-0V2
3754 1K
DC_PROT
3780 100K
3781 100K
OUT_RH
OUT_RL
0304 PH-S
F780 F781
F782
F784
F786 F787
RIGHT HIGH
8 Ohm
RIGHT LOW
2780 1n
2781 1n

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030502

0302 C1 F770 A8
0303 A8 F771 A8
0304 E8 F772 A8
0305 E1 F774 A8
0390 E2 F776 A8
0391 E3 F777 A8
1730 B3 F780 E8
1740 D3 F781 E8
2730 C3 F782 F8
2732 C4 F784 F8
2734 D5 F786 F8
2740 E3 F787 F8
2742 E4 F796 E2
2744 E5 F797 E2
2752 C9 F798 E2
2753 C8 F799 E2
2759 D8
2760 B7
2770 B8
2771 B7
2780 F7
2781 F7
2799 F1
3732 C4
3733 C5
3742 E4
3743 E5
3749 C6
3750 C8
3751 C9
3752 C9
3754 C9
3755 D6
3760 D8
3765 E6
3770 B7
3771 B7
3780 E7
3781 E7
3799 E2
5714 C3
5719 D3
5725 D3
5753 B9
6732 C4
6742 E4
6750 D7
6760 D7
7735 C5
7736 C4
7745 D5
7746 E4
7751 C8
7753 C9
7755 D8
7761 D9
C702 F3
C703 E3
C704 E3
F710 C2
F711 C2
F712 C2
F713 C2
F714 C2
F717 D2
F718 D2
F719 D2
F720 D3
F723 D2
F724 D2
F725 D2
F730 B5
F732 C4
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F742 E4
F743 E5
F745 D5
F746 E4
F759 C7

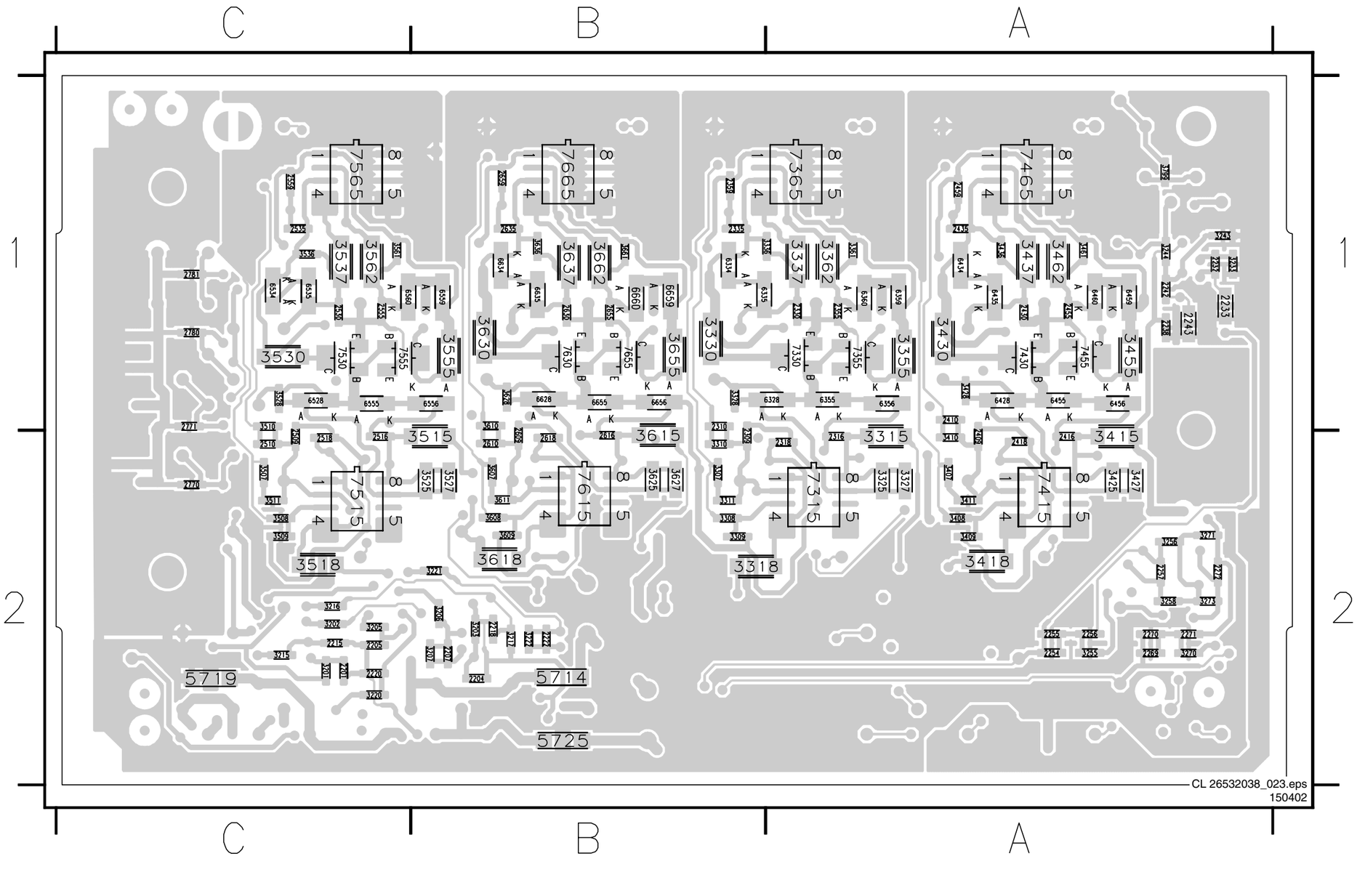
Layout Audio Panel (Top Side)

0302	B1	2216	C1	2315	A1	2440	A2	2566	C2	2734	A1	3211	C1	3272	A1	3403	A1	3601	B1	3749	C2	3780	C2	5565	C2	7225	B1	7503	B1	7753	C1
0303	C1	2217	B1	2319	A1	2460	A2	2615	B1	2740	A1	3230	B1	3274	A1	3404	A1	3602	B1	3750	C1	3781	C2	5635	B2	7238	A2	7540	C2	7755	C1
0304	C2	2221	B1	2334	A2	2465	A2	2619	B1	2742	A1	3231	A2	3301	A1	3406	A1	3603	B1	3751	C1	5335	A2	5660	B2	7260	A1	7602	B1	7761	C1
0388	C1	2224	B1	2340	A2	2466	A2	2634	B2	2744	A1	3232	A2	3302	A1	3440	A2	3604	B1	3752	C1	5360	B2	5665	B2	7302	A1	7603	B1		
1730	B1	2225	B1	2360	B2	2515	C1	2640	B2	2752	C1	3234	A2	3303	A1	3501	B1	3606	B1	3754	C1	5365	A2	5753	C1	7303	B1	7640	B2		
1740	B1	2234	A2	2365	B2	2519	C1	2660	B2	2753	C1	3240	B1	3304	A1	3502	C1	3640	B2	3755	B1	5435	A2	6732	A1	7340	A2	7735	A1		
2202	C1	2239	A2	2366	B2	2534	B2	2665	B2	2759	C1	3241	A2	3306	B1	3503	B1	3732	A1	3760	C1	5460	A2	6742	A1	7402	A1	7736	A1		
2203	B1	2244	A2	2415	A1	2540	C2	2666	B2	2760	C1	3242	A2	3340	A2	3504	B1	3733	A1	3765	B1	5465	A2	6750	C1	7403	A1	7745	A1		
2206	C1	2260	A1	2419	A1	2560	C2	2730	B1	2799	A1	3257	A1	3401	A1	3506	C1	3742	A1	3770	C1	5535	B2	6760	C1	7440	A2	7746	A1		
2212	C1	2261	A1	2434	A2	2565	C2	2732	B1	3210	C1	3259	A1	3402	A1	3540	B2	3743	A1	3771	C1	5560	C2	7211	C1	7502	C1	7751	C1		



Layout Audio Panel (Bottom Side)

2201	C2	2255	A2	2359	B1	2535	C1	2781	C1	3243	A1	3318	B2	3411	A2	3509	C2	3607	B2	3661	B1	6434	A1	6634	B1	7515	C2
2204	B2	2256	A2	2409	A2	2555	C1	3201	C2	3244	A1	3325	A2	3415	A2	3510	C1	3608	B2	3662	B1	6435	A1	6635	B1	7530	C1
2205	C2	2257	A2	2410	A1	2559	C1	3202	C2	3255	A2	3327	A2	3418	A2	3511	C2	3609	B2	3799	A1	6455	A1	6655	B1	7555	C1
2207	B2	2269	A2	2416	A2	2609	B2	3203	B2	3256	A2	3328	B1	3425	A2	3515	B2	3610	B1	5714	B2	6456	A1	6656	B1	7565	C1
2215	C2	2270	A2	2418	A2	2610	B2	3205	C2	3258	A2	3330	B1	3427	A2	3518	C2	3611	B2	5719	C2	6459	A1	6659	B1	7615	B2
2218	B2	2271	A2	2430	A1	2616	B2	3206	B2	3270	A2	3336	A1	3428	A1	3525	B2	3615	B2	5725	B2	6460	A1	6660	B1	7630	B1
2220	C2	2272	A2	2435	A1	2618	B2	3207	B2	3271	A2	3337	A1	3430	A1	3527	B2	3618	B2	6328	A1	6528	C1	7315	A2	7655	B1
2222	B2	2309	B2	2455	A1	2630	B1	3215	C2	3273	A2	3355	A1	3436	A1	3528	C1	3625	B2	6334	B1	6534	C1	7330	A1	7665	B1
2232	A1	2310	B1	2459	A1	2635	B1	3216	C2	3307	B2	3361	A1	3437	A1	3530	C1	3627	B2	6335	B1	6535	C1	7355	A1		
2233	A1	2316	A2	2509	C2	2655	B1	3217	B2	3308	B2	3362	A1	3455	A1	3536	C1	3628	B1	6355	A1	6555	C1	7365	A1		
2238	A1	2318	A2	2510	C2	2659	B1	3220	C2	3309	B2	3407	A2	3461	A1	3537	C1	3630	B1	6356	A1	6556	B1	7415	A2		
2242	A1	2330	A1	2516	C2	2770	C2	3221	B2	3310	B2	3408	A2	3462	A1	3555	B1	3636	B1	6359	A1	6559	B1	7430	A1		
2243	A1	2335	B1	2518	C2	2771	C1	3222	B2	3311	B2	3409	A2	3507	C2	3561	C1	3637	B1	6360	A1	6560	C1	7455	A1		
2254	A2	2355	A1	2530	C1	2780	C1	3233	A1	3315	A2	3410	A2	3508	C2	3562	C1	3655	B1	6428	A1	6628	B1	7465	A1		



LED/Switch Panel

LED/SWITCH PANEL

FROM 0320

SC8

CONTROLE FUNCTIONS

0320

PH-S

GREEN_LED F102

RED_LED F103

RC_IN F104

LIGHT_SENSOR_IN F105

F106 5100 F101 +8V6

F107 100MHZ

+5V_STBY_SW F108 +5V_STBY_SW

+9V_STBY_SW F109

+9V_STBY F112

1101

ON / OFF SWITCH

4101

3107 470R

4107

0317

LED_DISPLAY F115

IR_TX F116

GREEN_LED

RED_LED

F119

IR_RX F120

95009

ICONN for ITV only

+5V_STBY_SW

3102 100K

7103 BC857BW

3101 150R I102 6101 BZX384-C3V9 I103

3104 100K

7105 BC857BW

F110 F111

3103 220R

3105 330R

6105 BZX384-C3V9

I106

I104 I105 I107

6103-A TLMV3100

6103-B TLMV3100

3106 150R

GREEN RED

3108 10K

3109 100R

RC RECIEVER

7107 TSOP2236

I109 I111

VS OUT GND

CTRL CIRCUIT INP DEM BAND PASS AGC PIN

2107 100u

+8V6

2120 10u

7120-B LM358D

7120-A LM358D

I127

3120 4K7

I120 3123 10K I123

I125 3126 470K I126

2126 220n

3121 4K7

3122 1K

3124 1K

3125 3K3

6127 TEMD5000

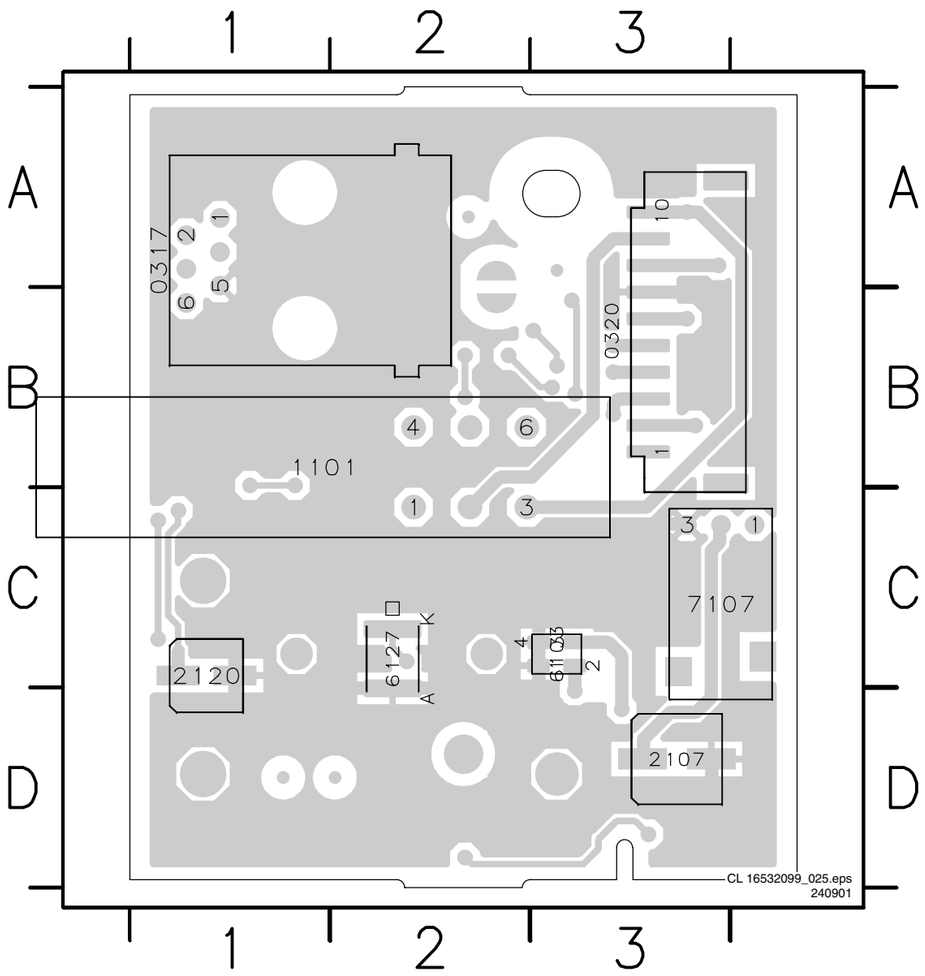
3127 470K

LIGHT SENSOR

CL 16532099_038.EPS
280901

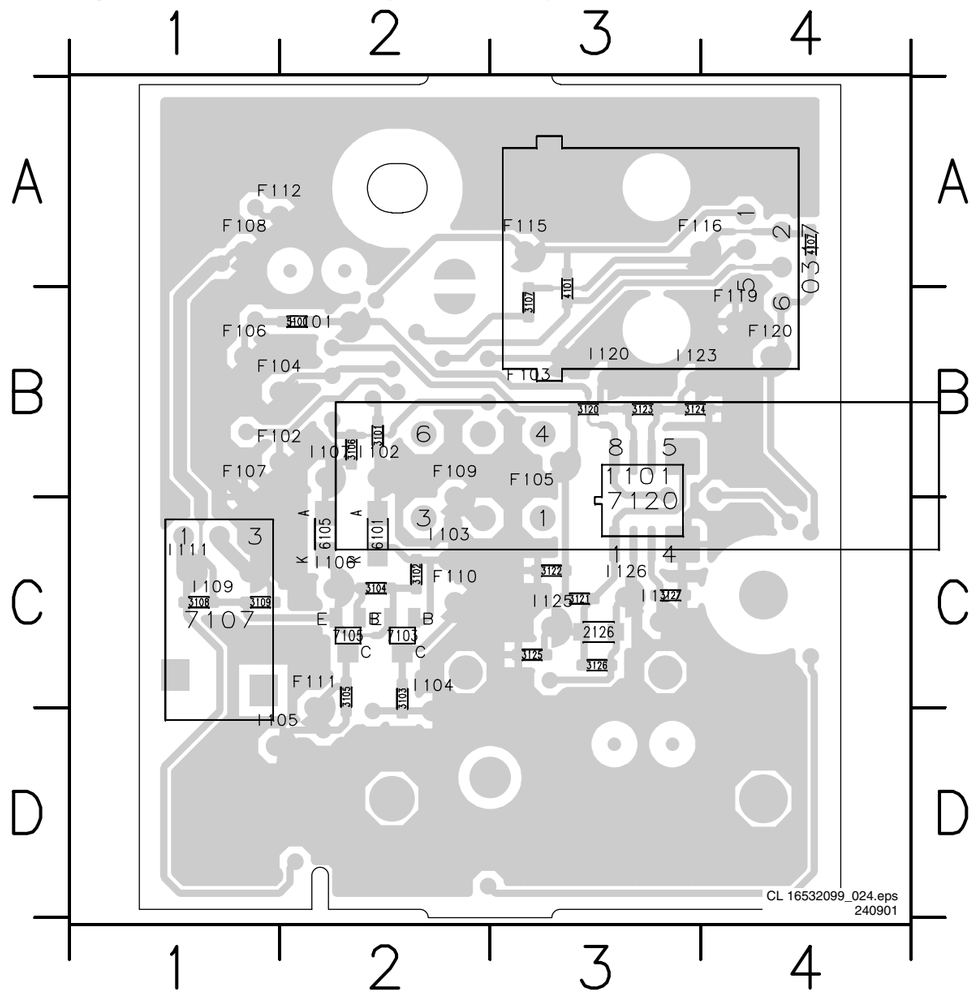
0317 A9
0320 B1
1101 D3
2107 C7
2120 E5
2126 F6
3100 C2
3101 C4
3102 B4
3103 C5
3104 B6
3105 C5
3106 D6
3107 B6
3108 B7
3109 B7
3120 E4
3121 F4
3122 F3
3123 F4
3124 F5
3125 F5
3126 F6
3127 F6
4101 C3
4107 B6
6101 C4
6103-A C5
6103-B D5
6105 C6
6127 F6
7103 B5
7105 B5
7107 C9
7120-A E6
7120-B E4
F101 C2
F102 C2
F103 C2
F104 C2
F105 C2
F106 C1
F107 C1
F108 C2
F109 D2
F110 C5
F111 C6
F112 D2
F115 A9
F116 A9
F119 B9
F120 B9
I102 B4
I103 B4
I104 C5
I105 C5
I106 C6
I107 C6
I109 C7
I111 C7
I120 F4
I123 F5
I125 E5
I126 E6
I127 E6

Layout LED/Switch Panel (Top Side)



0317 A1
0320 B3
1101 B1
2107 D3
2120 C1
6103 C3
6127 C2
7107 C3

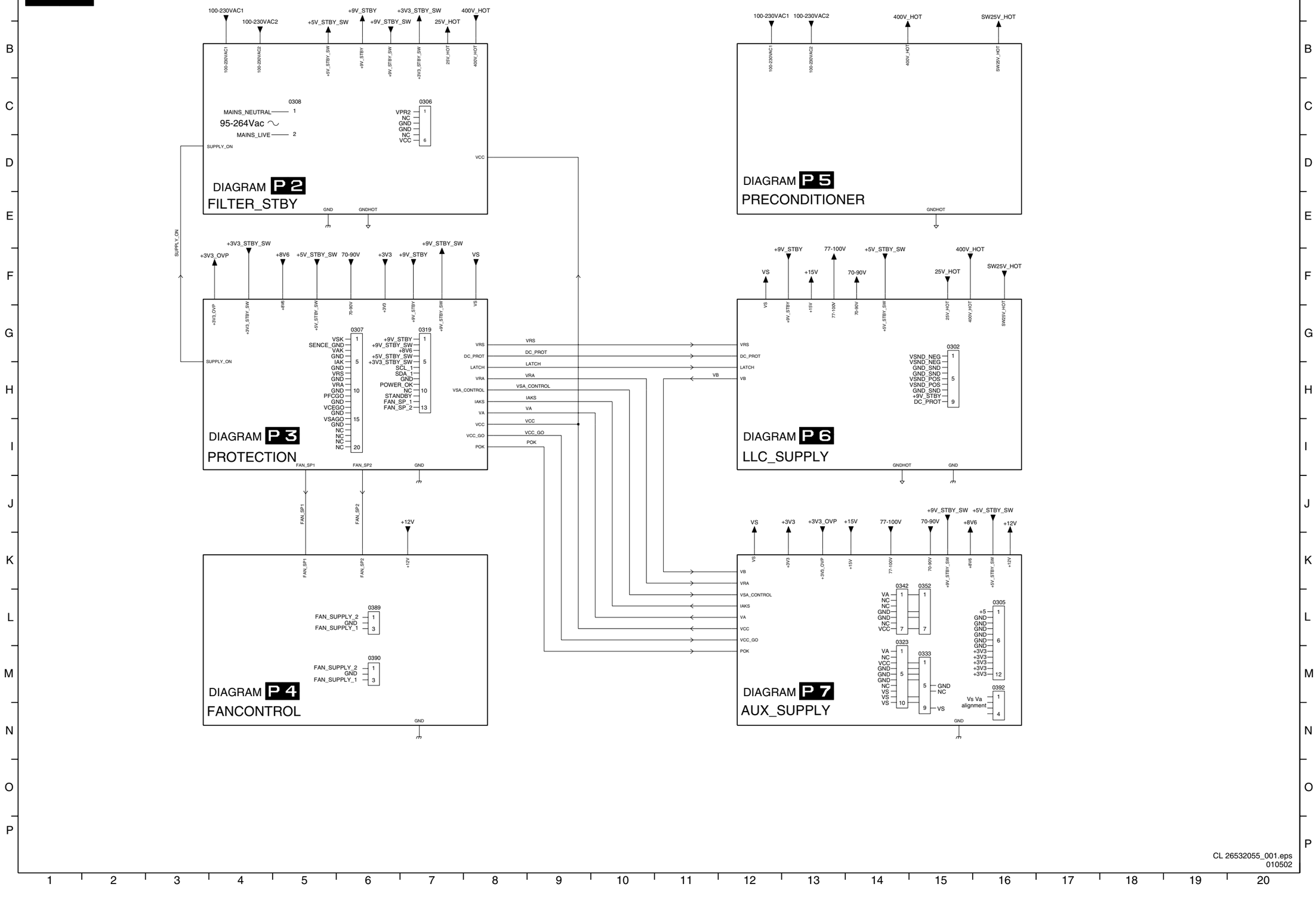
Layout LED/Switch Panel (Bottom Side)



0317 A4
1101 B3
2126 C3
3101 B2
3102 C2
3103 C2
3104 C2
3105 C2
3106 B2
3107 B3
3108 C1
3109 C1
3120 B3
3121 C3
3122 C3
3123 B3
3124 B3
3125 C3
3126 C3
3127 C3
4101 B3
4107 A4
5100 B2
6101 C2
6105 C2
7103 C2
7105 C2
7107 C1
7120 C3

Power Supply Panel: Function Blocks and Diagram Connections

P 1 SUPPLY (FUNCTION BLOCKS AND DIAGRAM CONNECTIONS)



CL 26532055_001.eps
010502

Power Supply Panel: Filter Standby

P 2 FILTER_STBY

MAINS FILTER

MAINS INPUT 95-264Vac

B2P3-VH

T6.3AH 250V 19181

DSP ERC12

CU28D3

MFLM PR02

RS1G

BYG10

BC857BW 7465

BC817-25W(COL) 7460

BC817-25W(COL) 7470

BAS316

RELAY CONTROL

STANDBY SUPPLY

CONTROL

TNY256

TCET1102

TL431CZ

STD16NE06L 7530

STD16NE06L 7531

L7805 7540

BZX384-C18 6530

BZX384-C18 6531

SB340 6505

SWITCH

SHIELDING 3.3

PH-B

TO P5 PRECONDITIONER

FROM P5 PRECONDITIONER

TO P6 LLC_SUPPLY

FROM P3 PROTECTION

TO P3 PROTECTION

TO P6 LLC_SUPPLY

TO P7 AUX_SUPPLY

FROM P7 AUX_SUPPLY

TO CN6 PDP (DISPLAY)

HOT GROUND

COLD GROUND

I407 = 0V
F411 = 0V
F412 = 4V2
F500 = 380V
F502 = 8V7
F503 = 3V3
I504 = 19V
I508 = 1V3
I513 = 2V2
I514 = 2V5
I516 = 8V1
I517 = 5V

MEASURED DC-VOLTAGES

NORMAL . .

STANDBY (. . .)

F404 — 100V / div DC, 10ms / div

F407 — 100V / div DC, 10ms / div

I406 — 100 V / div DC, 10ms / div

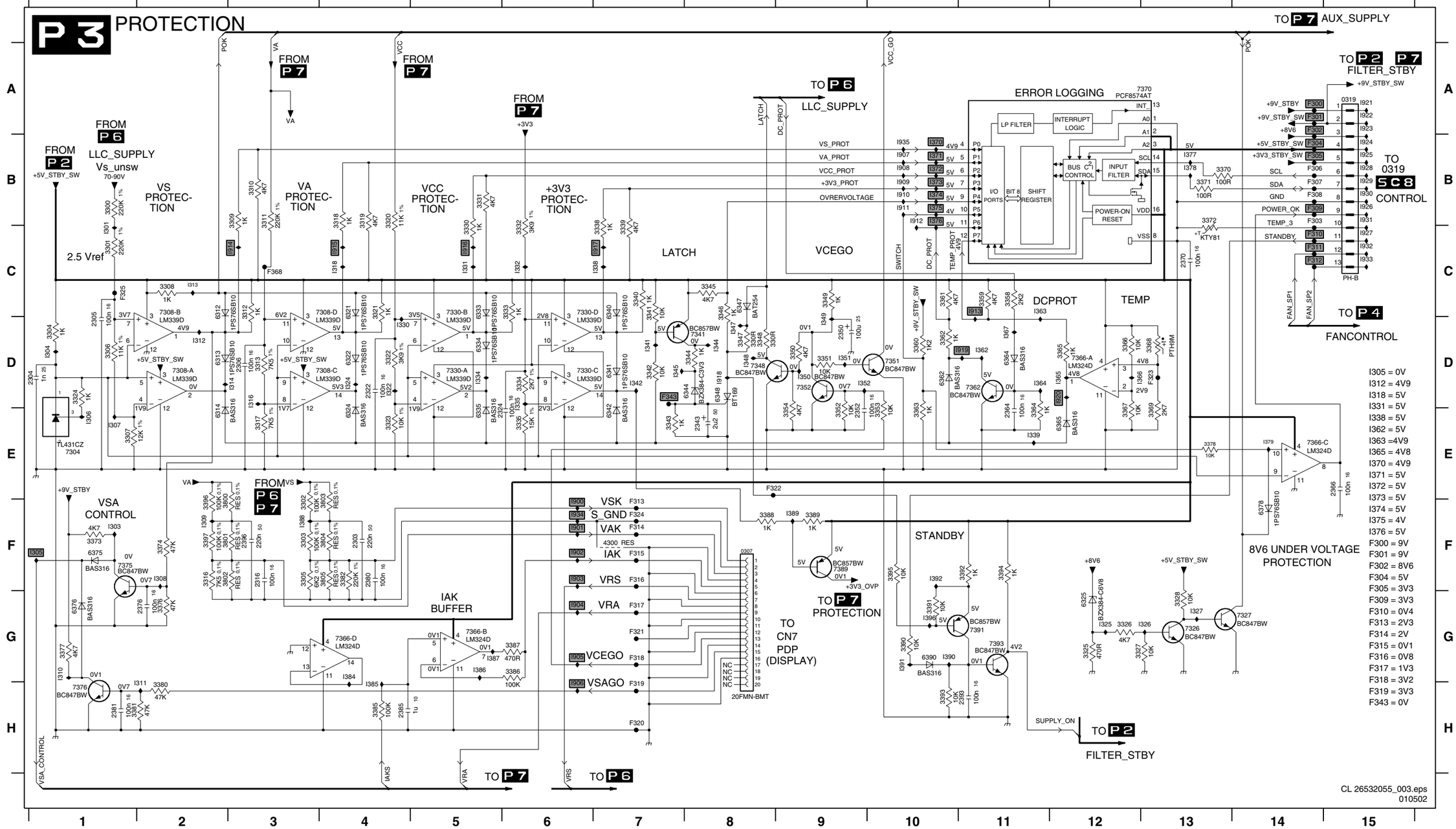
F510 — 200 V / div DC, 10µs / div

CL 26532055_002.eps
010502

0201 I5 F510 H9
0203 I4 I400 A4
0306 G9 I401 A3
0308 B1 I402 A5
1400 B3 I403 B4
1401 H9 I404 A6
1402 A4 I405 B6
1404 I9 I406 A9
1405 I10 I407 B9
1450 B8 I408 A10
1460 B10 I409 A10
2400 B3 I410 A12
2401 B5 I411 C11
2402 B2 I412 D10
2403 B1 I413 C12
2404 B4 I414 D12
2405 B4 I415 D12
2406 B5 I416 D12
2407 B5 I417 C13
2408 B7 I418 B2
2409 B7 I419 A8
2410 B7 I420 B8
2411 B5 I421 B6
2412 B6 I422 B6
2465 C11 I501 E4
2503 F5 I502 E5
2504 G4 I503 E5
2505 F5 I504 E5
2507 E7 I505 E6
2508 F7 I506 E7
2509 F7 I507 F7
2510 F7 I508 G4
2511 H7 I509 G4
2512 I7 I510 G6
2513 G4 I511 G6
2530 G11 I512 H7
2532 G12 I513 H7
2533 I12 I514 I7
2540 H11 I515 G11
2541 H11 I516 G12
3400 B3 I517 H12
3401 B2 I518 E6
3402 B2 I519 F9
3403 C2
3404 A4
3450 A10
3451 A10
3452 A11
3453 A11
3460 D10
3461 D10
3463 D11
3465 D12
3467 C12
3469 D12
3470 D12
3501 H7
3502 H7
3503 I8
3504 I8
3505 H8
3506 F4
3507 F4
3508 E5
3520 G11
3530 G12
5401 B4
5402 B5
5403 B7
5404 B6
5500 F6
5505 F9
6460 D11
6461 C11
6470 D13
6471 C13
6501 G6
6502 G6
6503 E6
6504 E7
6505 F7
6510 E3
6511 E4
6512 E5
6513 E6
6520 F11
6530 G12
6531 I12
7460 D11
7465 C12
7470 D13
7500 G5
7501 H6
7502 I7
7530 G12
7531 H12
7540 H11
9403 B7
F400 C1
F401 B1
F402 B2
F403 B2
F404 B2
F405 B2
F406 B1
F407 B2
F408 B2
F409 B3
F410 B3
F411 D13
F412 E12
F500 F5
F501 F5
F502 E8
F503 F8
F504 F7
F505 F7
F509 G9

Power Supply Panel: Protection

0307 F8	2350 D9	2396 F3	3309 B3	3321 C4	3332 C6	3344 D8	3354 E9	3367 E12	3378 E13	3391 G10	3803 F4	6325 G12	6362 D10	7308-C D3	7351 D10	7389 F9	F307 B14	F317 G7	F368 C3	I311 H2	I327 G13	I344 D8	I364 D11	I376 B10	I390 G10	I906 H6	I916 C5	I926 B15	
0319 A15	2352 E9	3300 B1	3310 B3	3322 D4	3333 C6	3345 C8	3358 C11	3368 D13	3380 H2	3392 F11	3804 F4	6333 C5	6364 D11	7308-D C3	7352 D9	7391 G11	F308 B14	F318 G7	I301 C1	I312 D2	I330 D4	I345 D7	I365 D12	I377 B13	I391 G10	I907 B10	I917 C7	I927 C15	
2303 F4	2364 E11	3301 C1	3311 B3	3323 E4	3334 D6	3346 C8	3359 C11	3369 E13	3381 H1	3393 H10	3805 F4	6334 D5	6365 E12	7326 G13	7362 D11	7393 G11	F309 B14	F319 H7	I303 F1	I313 C2	I331 C5	I347 D8	I366 D12	I378 B13	I392 F10	I908 B10	I918 D8	I928 B15	
2304 D1	2366 E15	3302 F3	3312 C3	3324 D1	3335 E6	3347 D8	3360 D10	3370 B13	3382 F4	3394 F11	4300 F7	6335 E5	6375 F1	7327 G14	7366-A D12	F300 A14	F310 C14	F320 H7	I304 D1	I314 D3	I332 C6	I335 D6	I350 D9	I371 B10	I385 H4	I901 F6	I911 B10	I921 A15	I931 B15
2305 D1	2370 C13	3303 F3	3313 D3	3325 G12	3338 C7	3348 D8	3361 C10	3371 B13	3385 H4	3395 F10	6312 C2	6340 C7	6378 F14	7330-A D5	7366-B G5	F301 A14	F311 C14	F321 G7	I305 F1	I315 D3	I334 D5	I348 D8	I349 D9	I372 B10	I386 G5	I902 F6	I912 B10	I922 A15	I932 C15
2306 D3	2376 G2	3304 D1	3314 F2	3326 G12	3339 C7	3349 C9	3362 D10	3372 B13	3386 G6	3396 F2	6313 D2	6341 D7	6378 F14	7330-B C5	7366-C E14	F302 A14	F312 C14	F322 E8	I306 E1	I316 D3	I335 D6	I349 D9	I350 D9	I373 B10	I387 G5	I903 F6	I913 C11	I923 A15	I933 C15
2316 F3	2380 F4	3305 F3	3317 E3	3327 G12	3340 C7	3350 D9	3363 E10	3373 F1	3387 G6	3397 F2	6314 E2	6342 E7	6390 G10	7330-C D6	7366-D G4	F303 B14	F313 F7	F323 D13	I307 E1	I322 D4	I338 C7	I351 D9	I352 D9	I374 B10	I388 F3	I904 G6	I914 C3	I924 B15	I934 F6
2322 D4	2381 H1	3306 D1	3318 B4	3328 G13	3341 C7	3351 D9	3364 E11	3374 F2	3388 F8	3800 F2	6321 C4	6343 C8	7304 E1	7330-D C6	7370 A13	F304 B14	F314 F7	F324 F7	I308 F2	I324 D4	I339 E11	I352 D9	I373 B10	I374 B10	I388 F3	I904 G6	I914 C3	I924 B15	I934 F6
2324 E6	2385 H4	3307 E1	3319 B4	3330 C5	3342 D7	3352 E9	3365 D12	3376 G2	3389 F9	3801 F2	6322 D4	6347 C8	7308-A D2	7341 D8	7375 F1	F305 B14	F315 F7	F325 C1	I309 F2	I325 G12	I341 D7	I362 D11	I374 B10	I388 F3	I904 G6	I914 C3	I924 B15	I934 F6	
2343 E8	2393 H11	3308 C2	3320 B4	3331 B5	3343 E7	3353 E10	3366 D12	3377 G1	3390 G10	3802 F2	6324 E4	6348 D8	7308-B C2	7348 D8	7376 H1	F306 B14	F316 F7	F343 D7	I310 G1	I326 G13	I342 D7	I363 C11	I375 B10	I389 F9	I905 G6	I915 C4	I925 B15	I935 B10	



Power Supply Panel: Fan Control

P 4 FANCONTROL

FROM P 7 AUX_SUPPLY

+12V

FAN_SUPPLY_1

2700 470u 16

6700 BZX384-C18

3700 330R

I700

I701

7700 SI9433DY

3703 1K0

I711

I703

FAN_SP1

3701 2K2

I704

7701 BC847BW

3702 2K2

6703 PRLL5819

2703 470u 16

5703 1m

I710

5704 100MHZ

F700 0389 1 2 F701 3 EH-B M FAN OPTIONAL

FAN_SUPPLY_2

I700 = 0V
F700 = 0V
F701 = 0V
I704 = 0V
I705 = 0V
I709 = 0V

6706 BZX384-C18

3706 330R

I705

I706

7706 SI9433DY

3709 1K0

I713

I708

FAN_SP2

3707 2K2

I709

7707 BC847BW

3708 2K2

6709 PRLL5819

2709 470u 16

5709 1m

I712

5710 100MHZ

0390 1 2 3 EH-B M FAN OPTIONAL

FROM P 3 PROTECTION

1704 SHIELDING 3.3

1702 SHIELDING 3.3

1703 SHIELDING 3.3

0389 B8
0390 D8
1702 I3
1703 I4
1704 I1
2700 B4
2703 C7
2709 E7
3700 B5
3701 C5
3702 C5
3703 B6
3706 D5
3707 E5
3708 E5
3709 E6
5703 B7
5704 B7
5709 D7
5710 D7
6700 B5
6703 C6
6706 D5
6709 E6
7700 B6
7701 C6
7706 D6
7707 E6
F700 B8
F701 B8
I700 B6
I701 B5
I703 C5
I704 C5
I705 D6
I706 D5
I708 E5
I709 E5
I710 B7
I711 C6
I712 D7
I713 E6

CL 26532055_004.eps
010502

Power Supply Panel: Pre-Conditioner

P5 PRECONDITIONER

PRECONDITIONER

MEASURED DC-VOLTAGES
NORMAL . .
STANDBY (. . .)

100-230VAC2
100-230VAC1
FROM P2 FILTER_STBY
GBU8 6600
6606 1N5406
6605 1N5406
5600 CE423D
2600 1n 1000
2601 1n 1000
2605 1u 400
F601
I603
I604
2611 220p 2000 6611 BYV29X-500
F600
400V
400V_HOT
TO P2 FILTER_STBY AND P6 LLC_SUPPLY
F996 F997 3999 1K F998 F999
I605 6608 BAS316 I634
2612 1n 50
1V5 (0V) I606
3610 3R3 SFR16
I607
7610 STY34NB50
5612 100MHZ
I608
2610 1n8 2000
I630
I609
1V4 (0V)
BC369 7608
2613 1n 50
I635
6609 BZT03-C18
0V (0V)
3608 1K SFR16
3611 1K
0V01 (0V)
MTL 2W 3614 0R1 MTL 2W 3615 0R1 MTL 2W 6615 RES
2616 220u 400
2617 220u 400
F604
F605
F608
SW25V_HOT
TO P6 LLC_SUPPLY

F601
100V / div DC
5ms / div

I607
5 V / div DC
5µs / div

F608
5V / div DC
5µs / div

F608
200 V / div DC
5µs / div

F610
5V / div DC
5µs / div

F600 = 380V
F604 = 0V
F609 = 14V7
I609 = 0V
I619 = 0V
I621 = 5V
I622 = 399V
I629 = 5V

3662 RES NFR25
3663 1R NFR25
I610 I631 I632 I611
2663 100u 50V
I612 6661 RS1G
6660 RS1G
2664 100u 50V
I613
6663 BAS316
3676 470R PR01
3675 220R PR01
I637
7660 L7815
31V (5V7)
14V9 (4V8)
I614 6665 PRLL5819
BIAS
2662 1m 25

F613
10 V / div DC
5ms / div

I620
5 V / div DC
5µs / div

F625
5 V / div DC
5µs / div

PRECONDITIONER CONTROL

3650 1M3 MRS25 1%
3653 820R
3668 1K NFR25H
F609
3642 100R
6640 PRLL5819
F610
3641 470R
I625
14V7 (4V8)
7641 BC337-25
1V2 (0V)
2642 1n 25
6641 BAS316
I626
6642 PRLL5819
I629
3673 1K NFR25H
I627
2674 22n 400
3674 1M VR25
2673 4n7 400
3670 750K MRS25 1%
I628
2671 100n 16
I636
3664 270K 1%
3671 10K 1%
2670 100n 16

7650 MC33368
5V (0V) VREF 1
6V9 (0V4) RD 2
5V (0V1) VFB 3
2V3 (0V) COMP 4
1V (0V01) MULT 5
0V1 (0V04) CS 6
3V7 (0V) ZC 7
AGND 8
LINE 16
NC1 15
NC2 14
(0V) 1V7 FC 13
(4V6) 14V7 VCC 12
(0V) 2V7 GATE 11
PGND 10
LEB 9
CONTROL
I621
I618
I619
I620
I623
I622
3655 10K
3667 10K
6654 BAS316
3654 10K
I617
2V3 (0V)
I615
3655 1K
I633
BC857BW 7654
2654 47u 25
I616
3652 1M
2656 100n 25
2652 1u RES 16
2655 1u 50
3651 10K
2651 10n 50
6651 RES
3666 100R
2666 4n7 50
6652 PRLL5819
2653 330p 50
6653 BZM55-C8V2
2672 100n 25
2608 1n 25
2665 470p 50
3639 1K
2640 470p 50
3640 330R
I624
2641 RES 25
6643 BZX384-C18
7640 BSN304
0V2 (0V)
1V5 D (0V)
S
F606

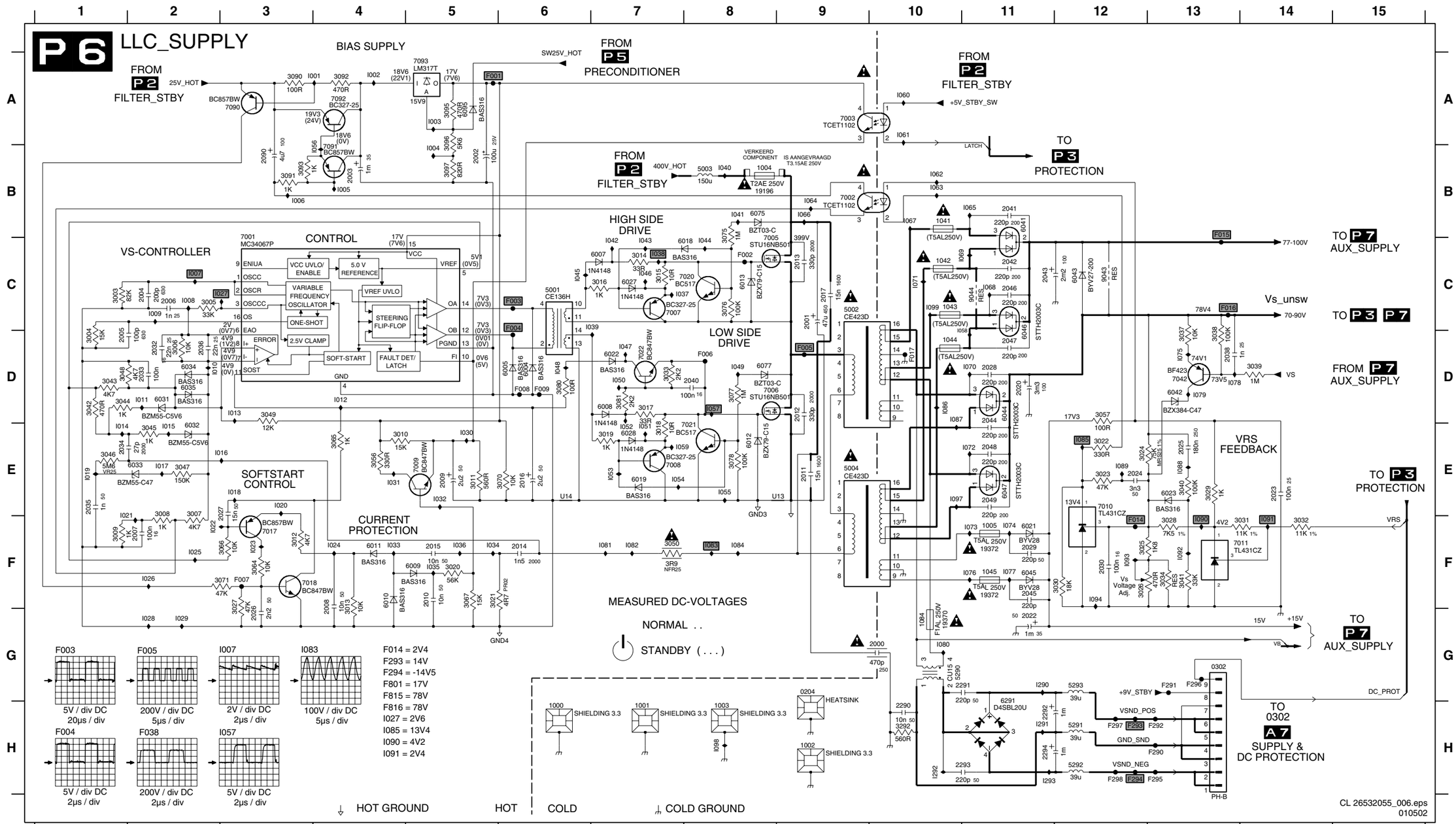
HOT GROUND
HOT BORDER

CL 26532055_005.eps
010502

2600 B3 I622 G7
2601 B2 I623 G8
2605 C3 I624 H9
2608 H8 I625 G10
2610 C7 I626 H11
2611 B8 I627 G12
2612 C6 I628 G12
2613 C6 I629 H12
2616 C9 I630 C8
2617 C9 I631 E6
2640 H9 I632 E7
2641 H9 I633 H2
2642 G11 I634 B6
2651 H4 I635 C7
2652 H3 I636 H12
2653 H5 I637 E9
2654 H1
2655 H3
2656 H2
2662 E10
2663 E8
2664 E8
2665 H8
2666 H4
2670 I12
2671 H12
2672 H7
2673 G12
2674 G12
3608 C5
3610 C6
3611 C7
3614 C7
3615 C8
3639 H8
3640 H9
3641 G9
3642 G10
3650 G3
3651 H3
3652 H3
3653 G5
3654 H1
3655 H1
3662 E7
3663 E7
3664 H12
3665 G8
3666 H4
3667 H6
3668 F7
3670 G12
3671 H12
3673 G12
3674 H12
3675 E9
3676 E9
3999 A11
5600 B5
5612 B7
6600 B2
6605 A3
6606 A2
6608 B6
6609 C7
6611 B8
6616 C8
6640 G10
6641 H10
6642 H11
6643 H9
6651 H4
6652 H5
6653 H5
6654 H1
6660 E8
6661 E8
6663 E9
6665 E10
7608 C6
7610 C7
7640 H10
7641 G10
7650 G6
7654 H2
7660 E9
F600 B10
F601 B3
F604 D10
F605 D10
F606 I10
F608 D11
F609 F9
F610 G9
F996 A10
F997 A10
F998 A11
F999 A11
I603 B5
I604 B7
I605 B5
I606 C6
I607 C7
I608 B7
I609 C8
I610 E6
I611 E7
I612 E8
I613 E8
I614 E9
I615 H1
I616 H3
I617 G2
I618 H4
I619 H4
I620 H5
I621 G4

Power Supply Panel: LLC Supply

U13 E9 U14 E6 0204 G9 0302 G13 1000 H6 1001 H7 1002 H9 1003 H8 1004 B8
1005 F11 1041 B10 1042 C10 1043 C10 1044 D10 1045 F11 1184 G10 2000 G10 2001 C9
2002 B5 2003 B4 2004 C2 2005 D1 2006 C2 2007 F2 2008 F4 2009 E5 2010 F5
2011 E9 2012 D9 2013 C9 2014 F6 2015 F5 2016 E6 2017 C9 2018 D11 2019 F12 2020 G11 2021 C11 2022 G11 2023 D2 2024 E12 2025 E13 2026 G3 2027 E13 2028 D11 2029 F11 2030 F12 2032 D2
2033 D2 2034 E1 2035 E1 2036 D2 2038 D13 2039 D8 2040 D8 2041 B11 2042 C11 2043 C11
2044 D11 2045 F11 2046 C11 2090 B3 2091 G11 2290 H10 3007 F2 3008 F2 3009 D2 3015 C7 3016 C7 3017 D7
2292 H11 2293 H11 2294 H11 3003 C1 3006 D2 3007 F2 3008 F2 3009 D2 3010 E4 3011 E5 3012 F3 3013 F4 3014 C7 3023 E12 3024 E12 3025 F12 3026 F12
3009 F1 3011 E5 3012 F3 3013 F4 3016 C7 3017 D7 3018 E7 3019 E7 3020 F5 3021 F5 3022 E12 3023 E12 3024 E12 3025 F12 3026 F12 3027 F3 3028 F13 3029 E13 3030 F12 3031 F14 3032 F14 3033 D7 3034 F13 3035 E13 3036 D2 3037 E1 3038 D13 3039 D14 3040 E13 3041 F13 3042 D1 3043 D1 3044 D1 3045 E2 3046 E1
3047 E2 3048 D1 3049 D3 3050 F7 3056 E4 3057 D12 3064 F3 3065 E4 3066 F3
3067 F5 3070 E6 3071 F3 3075 B8 3076 C8 3077 D8 3078 E8 3080 D6 3081 D7
3090 A3 3091 B3 3092 A4 3093 B3 3095 A5 3096 A5 3097 B5 3292 H10
5002 C9 5004 E9 5290 G10 5291 H12 5292 H12 5293 G12 6004 D6 6005 D6
6007 C7 6008 D7 6009 F5 6010 F4 6011 F4 6012 E8 6013 C8 6018 C8 6019 E7
6021 F11 6022 D7 6023 E13 6027 C7 6028 E7 6031 D2 6032 E2 6033 E2 6034 D2
6035 D2 6041 B11 6042 D13 6045 F11 6046 D11 6047 E11 6075 B8
6077 D8 6095 A5 6291 H11 7005 C8 7006 D8 7007 C7
7008 E7 7009 E5 7010 E12 7017 F3 7018 F3 7020 C8 7021 E8 7022 D7
7042 D13 7090 A3 7091 B4 7092 A4 7093 A5 7099 C12 7001 C3 7002 B9 7003 A5 7004 A4 7011 F13
F003 C6 F004 C6 F005 D9 F006 D8 F007 F3 F008 D6 F009 D6 F001 A5 F014 F12 F015 B13
F016 C13 F017 D10 F290 H13 F291 G13 F292 H13 F293 H12 F294 H12 F295 H13 F296 G13
F297 H12 F298 H12 1001 A4 1002 A4 1003 A5 1004 B5 1005 B4 1006 B3 1007 C2
I008 C2 I009 C2 I010 D2 I011 D2 I012 D4 I013 D3 I014 E1 I015 E2 I016 E3
I017 E2 I018 E3 I019 E1 I020 E3 I021 E1 I022 E2 I023 F3 I024 F4 I025 F2
I026 F2 I027 C3 I028 G2 I029 G2 I030 E5 I031 E5 I032 E5 I033 F5 I034 F5
I035 F5 I036 F5 I037 C7 I038 C7 I039 C7 I040 B8 I041 B8 I042 C7 I043 C7
I044 C8 I045 C6 I046 C7 I047 D7 I048 D6 I049 D8 I050 D8 I051 E7 I052 E7
I053 E7 I054 E7 I055 E8 I056 B4 I057 B5 I058 B4 I059 E7 I060 A10 I061 A10
I062 B10 I063 B10 I064 B9 I065 B11 I066 B9 I067 D11 I068 C11 I069 C10
I071 C10 I072 E11 I073 F11 I074 E11 I075 F7 I076 F11 I077 F11 I078 D13
I080 G10 I081 F7 I082 F7 I083 F8 I084 F8 I085 E12 I086 D10 I087 D10
I089 E12 I090 F13 I091 F14 I092 F13 I093 F12 I094 E12 I097 E10 I098 H8
I099 C10 I290 G11 I291 H11 I292 H10 I293 H11



Power Supply Panel: Aux Supply

P 7 AUX_SUPPLY

+3V3-SUPPLY

VA-SUPPLY

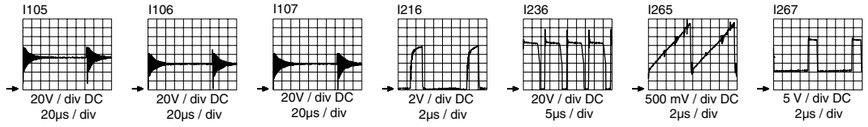
VCC-SUPPLY

SEQUENCE DISCHARGE

MEASURED DC-VOLTAGES
NORMAL . .
STANDBY . .

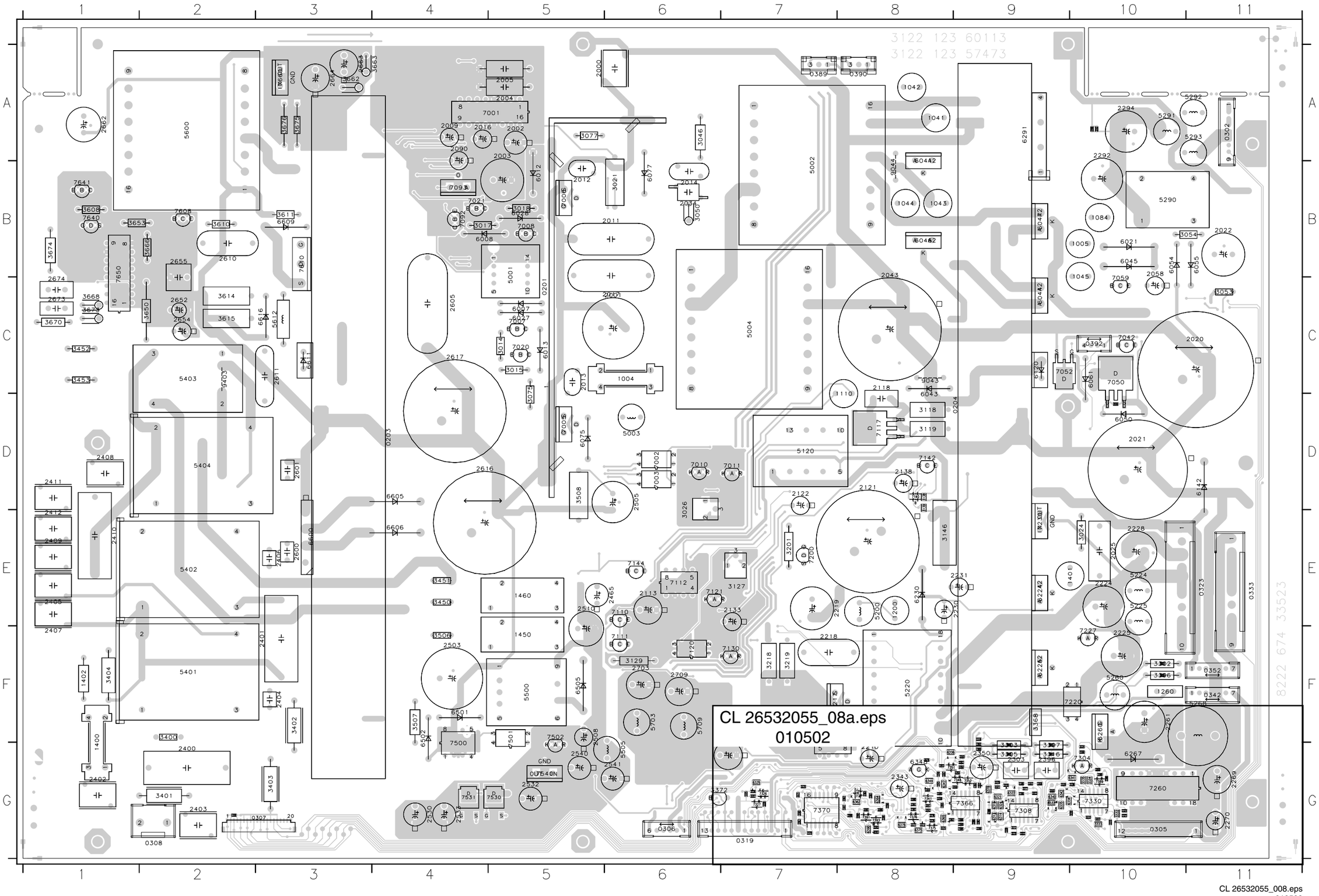
FROM P 6 LLC_SUPPLY
FROM P 3 PROTECTION +9V_STBY_SW
FROM P 2 FILTER_STBY +5V_STBY_SW
FROM P 6 LLC_SUPPLY +15V F260 1260 750mA 60V 361 5260 100u I261
FROM P 3 PROTECTION +3V3_OVP F115
TO P 3 PROTECTION +3V3
TO 0305 5C8 CONTROL-FUNCTIONS
TO P 3 PROTECTION IAKS VRA VSA_CONTROL VA
TO P 2 P 3 FILTER_STBY VCC
TO P 3 VS
TO P 6 P 3 VCC
TO P 2 P 3 VA
FROM P 6 LLC_SUPPLY +15V
TO CN33 PDP (DISPLAY)
TO CN23 PDP (DISPLAY)
TO CN42 PDP (DISPLAY)
TO CN52 PDP (DISPLAY)
TO P 4 FANCONTROL +12V
TO P 3 PROTECTION +8V6
FROM P 6 LLC_SUPPLY Vs_unsw 70-90V
TO P 3 PROTECTION FOK VCC_GO
FROM P 2 FILTER_STBY +5V_STBY_SW
Vs Va alignment
CL 26532055_007.eps 030502

0305 A13	3216 H8	I103 C3
0323 E13	3217 I8	I104 C2
0333 D12	3218 I9	I105 C1
0342 G12	3219 I9	I106 C3
0352 G13	3224 G11	I107 D4
0392 H4	3225 H11	I108 D5
1110 B1	3226 G11	I109 D2
1200 G5	3228 F12	I110 D3
1260 A6	3240 G4	I111 D4
2021 I3	3241 H4	I112 D3
2050 G3	3260 B7	I113 E1
2054 C1	3261 B7	I114 E2
2055 E2	3262 A8	I115 D2
2058 H2	3264 A8	I116 D2
2059 I1	3265 A8	I117 D3
2061 I2	3268 B11	I118 C4
2110 A4	4268 B11	I119 D4
2111 D1	5120 C5	I120 D8
2112 D1	5200 G5	I121 D7
2113 E1	5220 G9	I122 E11
2114 E2	5224 G11	I123 D9
2117 D3	5225 G11	I124 D7
2118 C4	5260 A6	I125 D9
2121 D11	5268 B11	I126 D8
2122 D8	6050 G3	I127 D8
2123 D8	6054 E1	I128 D8
2126 E8	6055 E1	I129 E10
2133 E9	6061 I3	I131 E7
2138 D6	6086 I1	I132 E9
2203 I4	6111 D1	I133 C5
2205 I6	6112 E1	I134 C5
2210 I6	6113 D2	I135 C6
2211 I7	6117 C3	I140 A2
2212 H7	6120 D4	I141 A3
2217 I8	6123 D8	I142 A3
2218 H9	6133 B6	I143 A4
2219 H9	6142 G4	I152 C9
2222 H10	6202 I4	I153 D6
2223 G10	6205 I5	I154 D7
2224 G10	6206 F5	I155 D6
2225 H10	6211 I7	I156 D6
2226 G11	6213 I7	I157 E6
2227 G11	6216 H8	I158 C1
2228 H12	6224 G10	I159 E1
2230 I11	6225 H10	I160 E2
2231 I11	6230 I10	I161 G2
2232 I10	6232 I10	I200 G3
2260 B7	6260 B6	I201 H3
2261 A7	6267 B10	I202 I3
2262 A7	7050 G3	I203 I2
2263 B8	7052 I3	I204 I1
2264 B8	7058 I1	I207 I1
2265 A8	7059 I2	I208 H5
2266 B8	7110 C2	I209 H9
2267 B10	7111 C2	I210 G5
2268 A10	7112 C2	I211 G6
2269 B11	7117 C3	I212 G6
2270 A9	7120 C4	I213 H5
3051 G2	7121 D7	I214 H7
3053 H3	7130 E9	I215 H6
3054 B1	7134 E10	I216 H8
3058 G2	7140-A D5	I217 H8
3062 H2	7140-B D6	I218 H7
3083 H2	7142 D6	I219 I8
3084 I1	7143 A3	I220 H4
3085 I1	7144 A3	I221 I7
3086 I2	7145 A4	I222 I4
3087 I1	7200 G6	I224 I8
3088 I1	7202 H5	I225 I1
3110 C2	7212 H7	I230 F11
3111 C2	7217 H8	I231 F11
3112 D1	7220 F9	I232 G10
3113 D2	7227 H11	I233 G10
3114 D2	7230 I11	I234 G11
3115 D3	7260 A10	I235 G10
3116 D3	F102 C13	I236 H9
3117 D3	F106 F13	I237 H11
3118 D4	F107 G13	I238 H10
3119 D4	F110 A1	I240 I9
3120 D7	F111 C9	I241 I10
3121 D7	F113 G4	I243 I10
3122 D8	F114 I11	I259 A9
3123 D8	F115 A9	I261 A7
3124 D8	F116 I11	I262 A8
3125 E8	F118 E12	I263 A8
3126 E7	F119 E12	I264 B8
3127 E7	F120 F12	I265 B7
3128 E8	F121 E13	I266 B7
3129 C1	F122 C12	I267 A10
3130 D8	F123 E13	I268 B11
3131 D9	F124 C12	I269 B10
3132 E8	F125 E11	I270 B11
3133 C8	F126 E11	I271 A8
3134 D10	F127 E11	
3135 E10	F128 E11	
3136 E10	F129 F12	
3138 D5	F130 D12	
3139 D6	F131 D12	
3140 E6	F132 F13	
3141 E6	F133 F12	
3142 E6	F134 F12	
3146 C6	F135 G12	
3147 D9	F136 G12	
3148 A2	F137 G13	
3149 B2	F138 H12	
3150 A3	F139 H13	
3151 A3	F140 G12	
3152 B4	F240 H4	
3200 G5	F241 H4	
3201 G6	F260 A6	
3202 H5	F261 B12	
3203 I4	F262 B12	
3204 I5	F263 B13	
3205 I5	F264 B13	
3212 H6	F265 A6	
3213 I7	I101 B2	
3214 I7	I102 C2	



F116 = 12V4	I201 = 78V3
F261 = 3V3	I202 = 0V
I101 = 76V	I208 = 0V
I124 = 10V6	I213 = 0V
I127 = 2V8	I214 = 14V2
I128 = 3V9	I220 = 9V
I132 = 2V6	I261 = 17V3
I200 = 97V	I266 = 0V

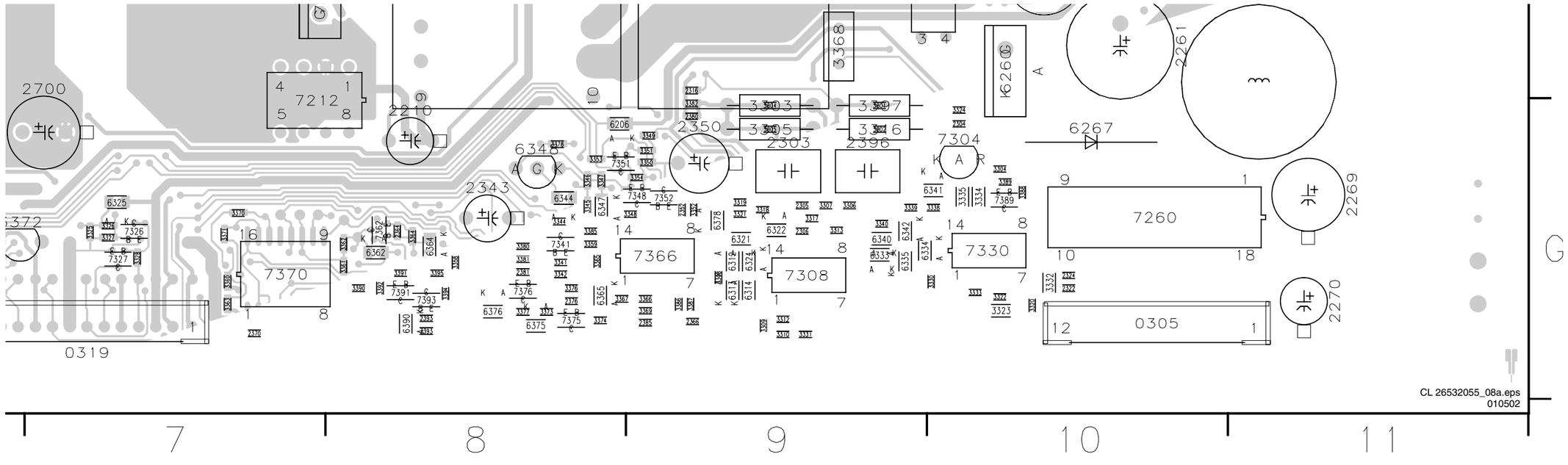
Layout Power Supply Panel (Top Side)



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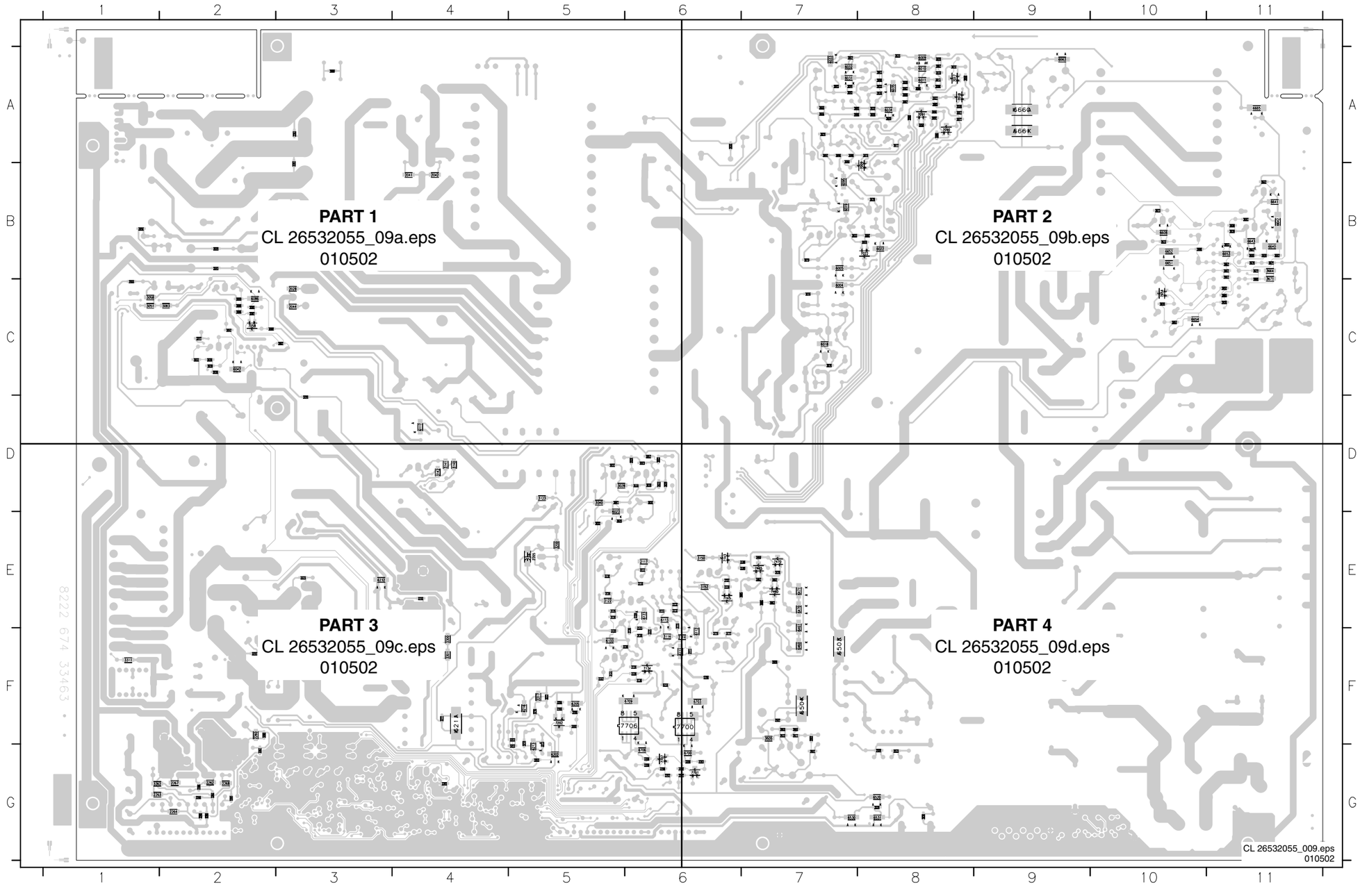
Layout Power Supply Panel (Part 1 Top Side)

0201	C5	2001	C6	2230	E9	2406	E3	2703	F6	3309	G9	3349	G9	3389	G10	3673	C1	5612	C3	6314	G9	7005	D5	7326	G7
0203	D4	2002	A5	2231	E9	2407	F1	2709	F6	3310	G9	3350	G9	3390	G8	3674	B1	5703	F6	6321	G9	7006	B5	7327	G7
0204	D9	2003	A5	2261	F10	2408	D1	3014	C5	3312	G9	3351	G9	3391	G8	3675	A3	5709	F6	6322	G9	7007	C5	7330	G10
0302	A11	2004	A5	2269	G11	2409	E1	3015	C5	3313	G9	3352	G9	3392	G8	3676	A3	6007	C5	6324	G9	7008	B5	7341	G8
0305	G10	2005	A5	2270	G11	2410	E1	3017	B4	3316	G9	3353	G8	3393	G8	3800	F10	6008	B4	6325	G7	7010	D6	7348	G9
0306	G6	2009	A4	2290	A10	2411	D1	3018	B5	3317	G9	3354	G9	3394	G8	3801	G9	6012	B5	6333	G9	7011	D7	7351	G8
0307	G3	2011	B6	2292	A10	2412	E1	3021	B6	3318	G9	3358	G8	3395	G8	3802	G9	6013	C5	6334	G9	7020	C5	7352	G9
0308	G2	2012	B5	2294	A10	2465	E6	3024	E10	3319	G9	3359	G8	3396	F10	3803	F10	6021	B10	6335	G9	7021	B4	7362	G8
0319	G7	2013	C5	2303	G9	2503	F4	3026	E6	3320	G10	3360	G7	3397	G9	3804	G9	6027	C5	6340	G9	7042	C10	7366	G9
0323	E11	2014	B6	2304	G10	2505	D6	3046	A6	3321	G9	3361	G8	3400	F2	3805	G9	6028	B5	6341	G10	7050	C10	7370	G7
0333	E11	2016	A4	2305	G9	2508	F5	3050	B6	3322	G10	3362	G8	3401	G2	4300	G2	6041	B8	6342	G9	7052	C9	7375	G8
0342	F11	2017	C6	2306	G9	2510	E5	3053	C11	3323	G10	3363	G7	3402	F3	5001	B5	6043	D8	6344	G8	7059	C10	7376	G8
0352	F11	2020	C11	2316	F9	2530	G4	3054	B11	3324	G10	3364	G8	3403	G3	5002	B7	6044	C9	6347	G8	7092	B4	7389	G10
0389	A7	2021	D10	2322	G10	2532	G5	3075	D5	3325	G7	3365	G8	3404	F1	5003	D6	6045	B10	6348	G8	7093	B4	7391	G8
0390	A8	2022	B11	2324	G10	2533	G4	3077	A5	3326	G7	3366	G9	3450	E4	5004	C7	6046	B8	6362	G8	7110	E6	7393	G8
0392	C10	2025	E10	2343	G8	2540	G5	3118	D8	3327	G7	3367	G8	3451	E4	5120	D7	6047	B9	6364	G8	7111	F6	7500	G4
1004	C6	2034	B6	2350	G9	2541	G6	3119	D8	3328	G7	3368	F9	3452	C1	5200	E8	6050	D10	6365	G8	7112	E6	7501	F5
1005	B10	2043	B8	2352	G9	2600	E3	3127	E7	3330	G10	3369	G9	3453	C1	5220	F8	6054	B10	6375	G8	7117	D8	7502	F5
1041	A8	2050	D10	2364	G8	2601	D3	3129	F6	3331	G9	3370	G7	3506	F4	5224	E10	6055	B11	6376	G8	7120	F6	7530	G5
1042	A8	2058	B10	2366	G9	2605	C4	3138	D8	3332	G10	3371	G7	3507	F4	5225	E10	6061	C10	6378	G9	7121	E6	7531	G4
1043	B8	2090	A4	2370	G7	2610	B2	3139	D8	3333	G10	3372	G6	3508	D5	5260	F10	6075	D5	6390	G8	7130	F7	7540	G5
1044	B8	2113	E6	2376	G8	2611	C3	3146	E8	3334	G10	3373	G8	3608	B1	5268	F11	6077	B6	6501	F4	7140	D8	7608	B2
1045	B10	2118	C8	2380	G9	2616	D4	3201	E7	3335	G10	3374	G8	3610	B2	5290	B10	6120	C9	6502	F4	7142	D8	7610	B3
1084	B10	2121	D8	2381	G8	2617	C4	3218	F7	3338	G10	3376	G8	3611	B3	5291	A10	6142	D11	6505	F5	7144	E6	7640	B1
1110	D8	2122	D7	2385	G9	2652	C2	3219	F7	3339	G9	3377	G8	3614	C2	5292	A11	6206	G8	6600	E3	7200	E7	7641	B1
1200	E8	2133	E7	2393	G8	2654	C2	3292	A10	3340	G9	3378	G8	3615	C2	5293	A11	6224	E9	6605	D4	7212	G7	7650	B1
1260	F10	2138	D8	2396	G9	2655	B2	3302	F10	3341	G8	3380	G8	3650	C2	5401	F2	6225	F9	6606	E4	7217	F7	7660	A3
1400	G1	2210	G8	2400	G2	2662	A1	3303	G9	3342	G8	3381	G8	3653	B1	5402	E2	6230	E8	6609	B3	7220	F10	9043	C8
1401	E10	2218	F7	2401	F3	2663	A3	3304	G10	3344	G8	3382	G9	3662	A3	5403	C2	6260	F10	6611	C3	7227	F10	9044	B8
1402	F1	2219	E7	2402	G1	2664	A3	3305	G9	3345	G8	3385	G8	3663	A4	5404	D2	6267	G10	6616	C3	7230	E9	9403	C2
1450	F5	2224	E10	2403	G2	2673	C1	3306	G9	3346	G8	3386	G9	3666	B2	5500	F5	6291	A9	7001	A5	7260	G10		
1460	E5	2225	F10	2404	F3	2674	C1	3307	G9	3347	G8	3387	G9	3668	C1	5505	G6	6312	G9	7002	D6	7304	G10		
2000	A5	2228	E10	2405	E1	2700	F7	3308	G9	3348	G9	3388	G10	3670	C1	5600	A2	6313	G9	7003	D6	7308	G9		

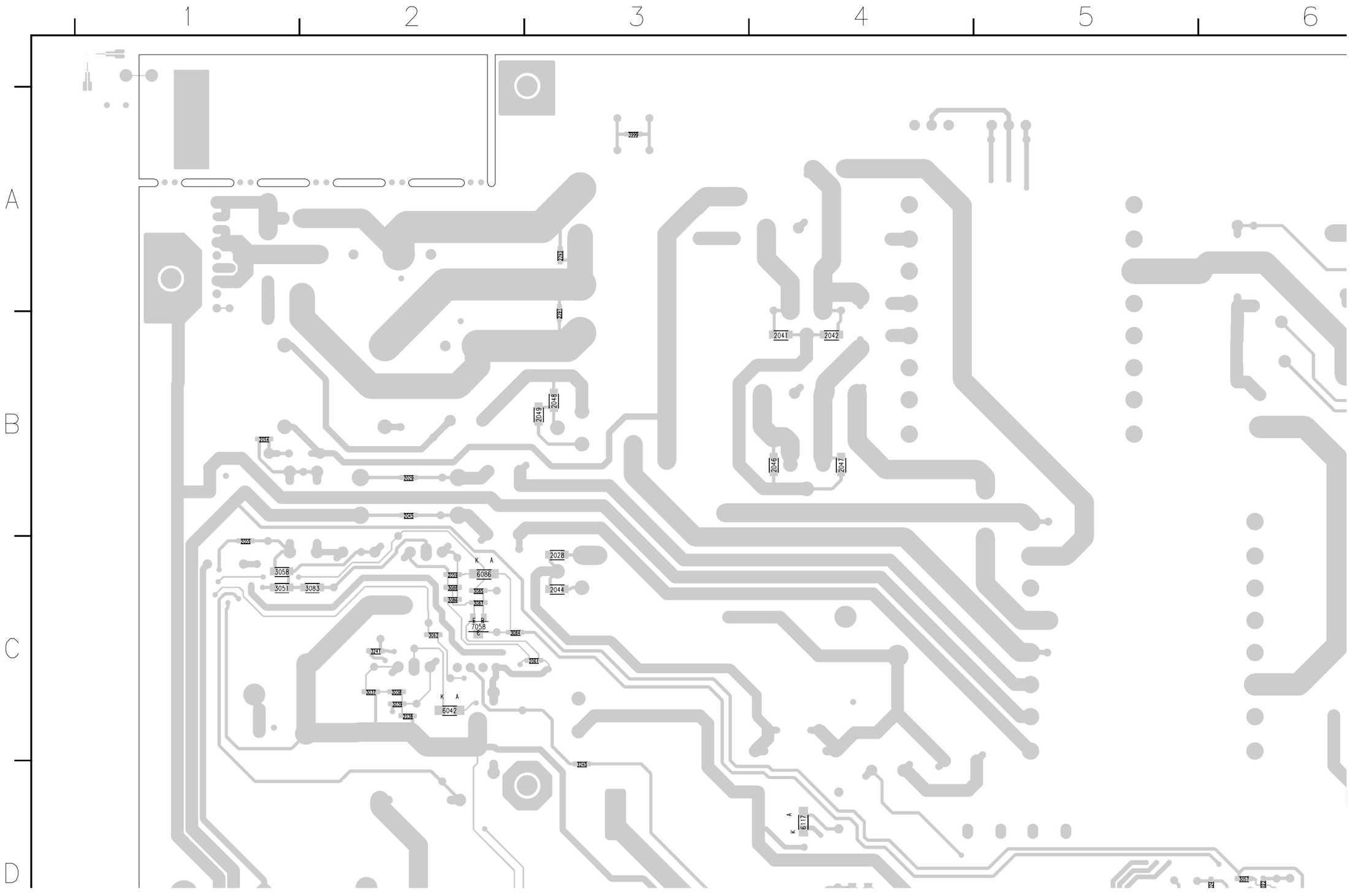


Layout Power Supply Panel (Overview Bottom Side)

2006 A7	2035 A6	2059 C2	2222 F3	2293 A3	2653 B11	3010 A8	3031 D5	3048 A8	3078 B8	3096 A7	3124 E5	3147 F5	3216 F5	3300 F4	3504 F7	3667 B11	6503 F7		
2007 A8	2036 A8	2061 C3	2223 E3	2504 G8	2656 C11	3011 A8	3032 E5	3049 A8	3080 A8	3097 A7	3125 E5	3148 E7	3217 F5	3301 F4	3505 F7	3671 B11	6504 F7		
2008 A8	2038 C2	2110 E6	2226 F2	2507 F7	2665 C11	3012 A8	3033 B7	3051 C1	3081 B8	3110 F6	3126 E5	3149 E7	3224 F2	3311 F1	3520 G8	3700 G6	6510 F9		
2010 A8	2040 B8	2111 F6	2227 F2	2509 F7	2666 B10	3013 A8	3034 D6	3056 A7	3083 C2	3111 F6	3128 E6	3150 E6	3225 F2	3343 G4	3530 G8	3701 G6	6511 F9		
2015 A8	2041 B4	2112 E6	2232 E4	2511 F7	2670 B11	3016 C7	3037 C2	3057 D6	3084 C2	3112 E6	3130 F6	3151 E6	3226 F2	3460 E7	3639 B11	3702 G6	6512 F9		
2023 D6	2042 B4	2114 F6	2260 F2	2512 F7	2671 B11	3019 B7	3038 C2	3058 C1	3085 C2	3113 E6	3131 F5	3152 E6	3228 F3	3461 E7	3640 B11	3703 G6	6513 F9		
2024 D6	2044 C3	2117 E6	2262 G2	2513 G8	2672 B11	3020 A8	3039 C2	3062 C2	3086 C2	3114 F6	3132 E5	3200 E5	3240 D3	3463 E7	3641 B11	3706 G6	6520 G8		
2026 A8	2045 B2	2123 F6	2263 G1	2608 B11	3003 A7	3022 D6	3040 D5	3064 A8	3087 C2	3115 E6	3133 F5	3202 F5	3241 C2	3465 E6	3642 B11	3707 G6	6530 G7		
2027 A8	2046 B4	2126 F6	2264 G2	2612 B10	3004 A7	3023 D6	3041 D5	3065 A8	3088 C2	3116 E6	3134 F6	3203 G5	3260 F2	3467 E7	3651 B11	3708 G6	6531 G8		
2028 C3	2047 B4	2203 F5	2265 G2	2613 B10	3005 A7	3025 E5	3042 A7	3066 A8	3090 A8	3117 E6	3135 F6	3204 F5	3261 G2	3469 E7	3652 C11	3709 G6	6608 B10		
2029 B2	2048 B3	2205 E5	2266 G2	2640 B11	3006 A8	3027 A8	3043 A8	3067 A8	3091 A8	3120 F6	3136 F6	3205 F5	3262 G1	3470 E7	3654 C10	3999 A3	6640 B11		
2030 D6	2049 B3	2211 F4	2267 G2	2641 B11	3007 A8	3028 D5	3044 A7	3070 A7	3092 A8	3121 F6	3140 D4	3212 G5	3264 G2	3501 G7	3655 C10	4268 G2	6641 B11		
2032 A8	2054 B1	2212 F5	2268 G2	2642 B11	3008 A8	3029 D6	3045 A7	3071 A8	3093 A8	3122 E5	3141 D4	3213 G5	3265 G2	3502 F7	3664 B11	5704 F6	6642 B11		
2033 A8	2055 C1	2217 F5	2291 B3	2651 B11	3009 A8	3030 D6	3047 A7	3076 C7	3095 A7	3123 D5	3142 D4	3214 F5	3268 G2	3503 F7	3665 C11	5710 F6	6643 B11		
																6004 C7	6651 B10		
																6005 B7	6652 B10		
																6009 A8	6653 B11		
																6010 A8	6654 C10		
																6011 A8	6660 A9		
																6018 C7	6661 A9		
																6019 B7	6663 A9		
																6022 B8	6665 A11		
																6023 E5	6700 G6		
																6031 A7	6703 F6		
																6032 A7	6706 G6		
																6033 A7	6709 F6		
																6034 A8	7009 B8		
																6035 A8	7017 A8		
																6042 C2	7018 A8		
																6086 C2	7022 B8		
																6095 B7	7058 C2		
																6111 F6	7090 A8		
																6112 F6	7091 A8		
																6113 E6	7134 F6		
																6117 D4	7143 E6		
																6123 E6	7145 E6		
																6133 F5	7202 F5		
																6202 G5	7460 E7		
																6205 F5	7465 E7		
																6211 F4	7470 E7		
																6213 G5	7654 C10		
																6216 F5	7700 F6		
																6232 E3	7701 G6		
																6460 F7	7706 F6		
																6461 E7	7707 G6		
																6470 E7			
																6471 E7			

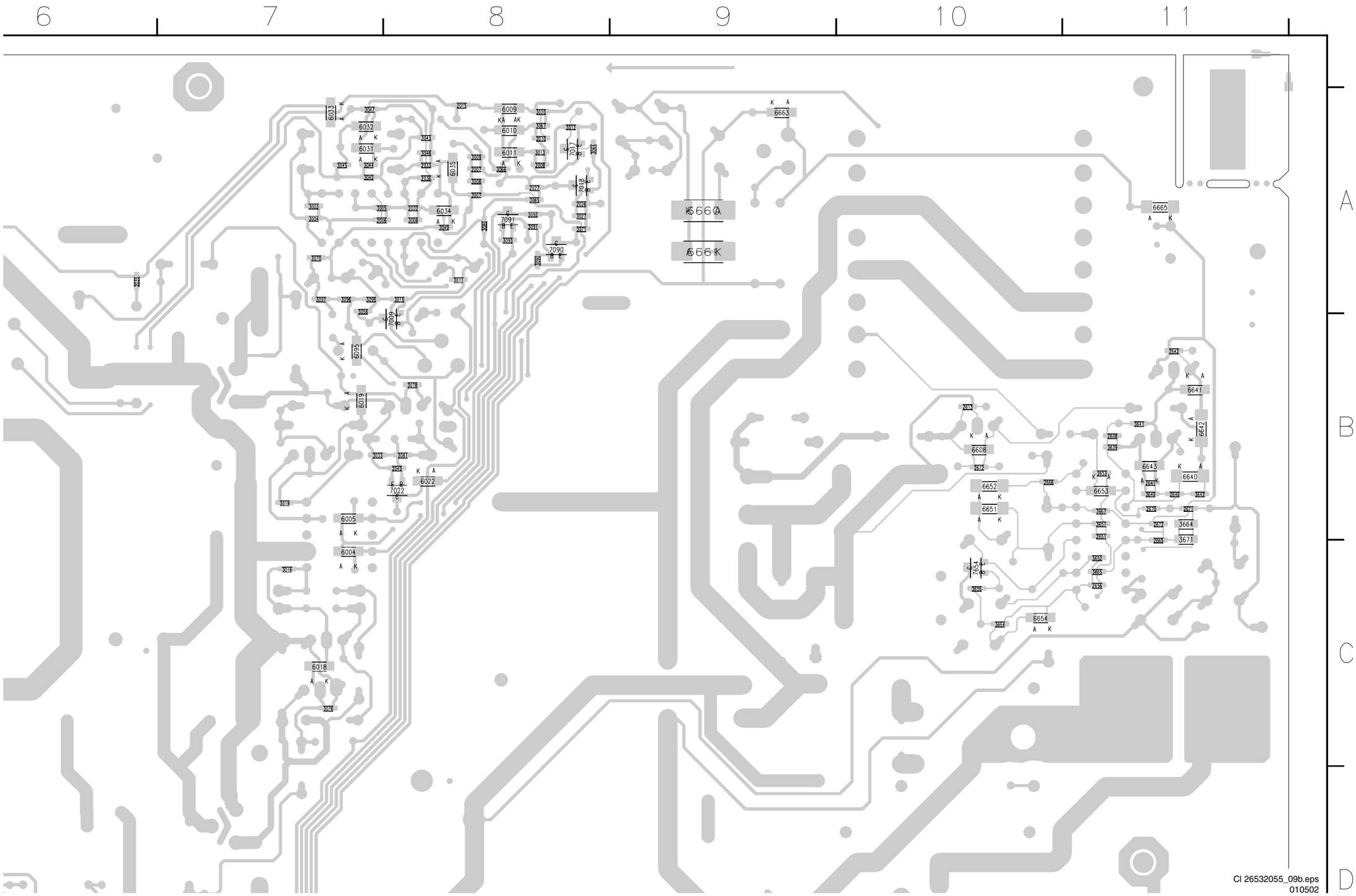


Layout Power Supply Panel (Part 1 Bottom Side)

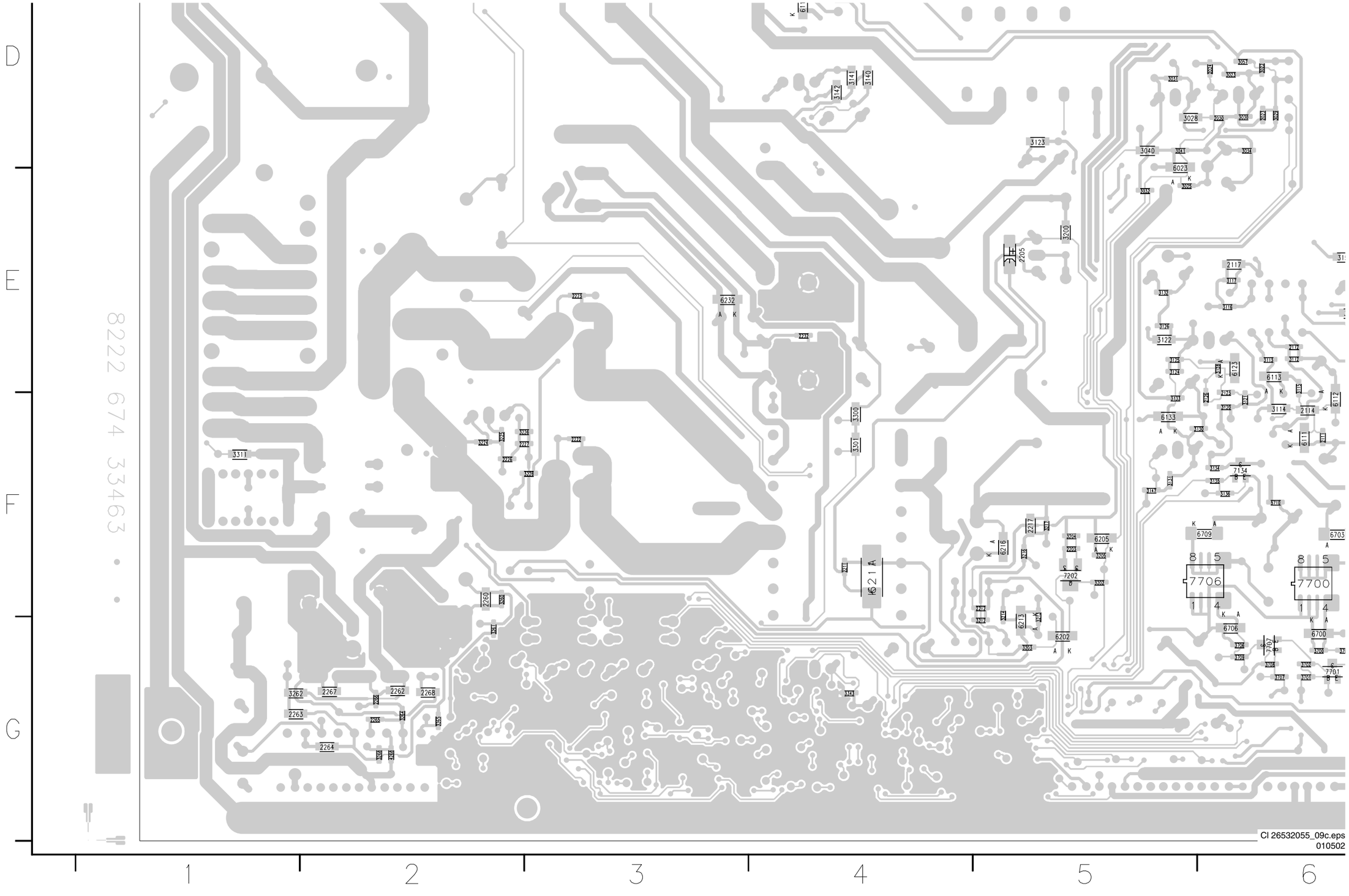


CI 26532055_09a.eps
010502

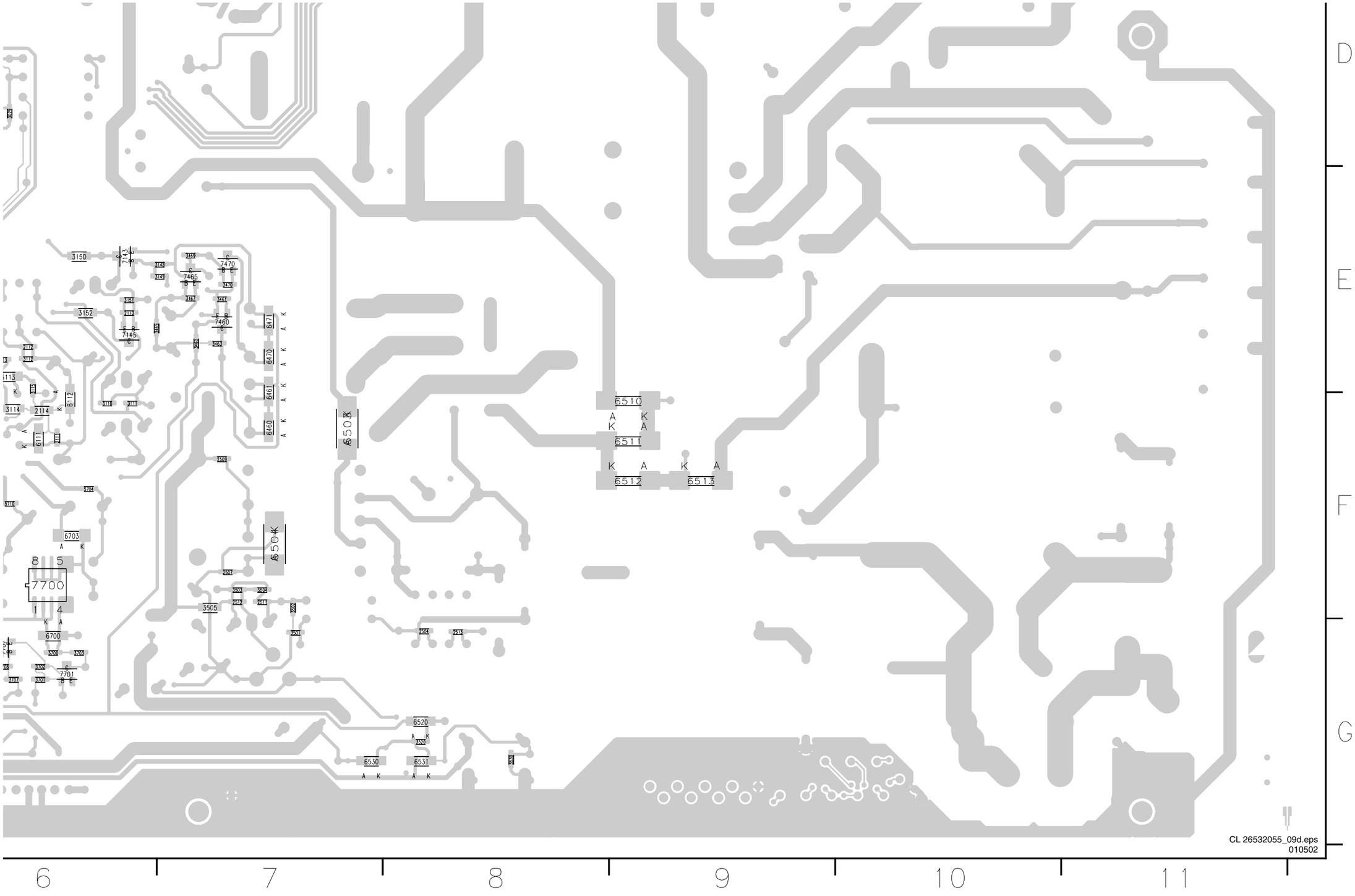
Layout Power Supply Panel (Part 2 Bottom Side)



Layout Power Supply Panel (Part 3 Bottom Side)

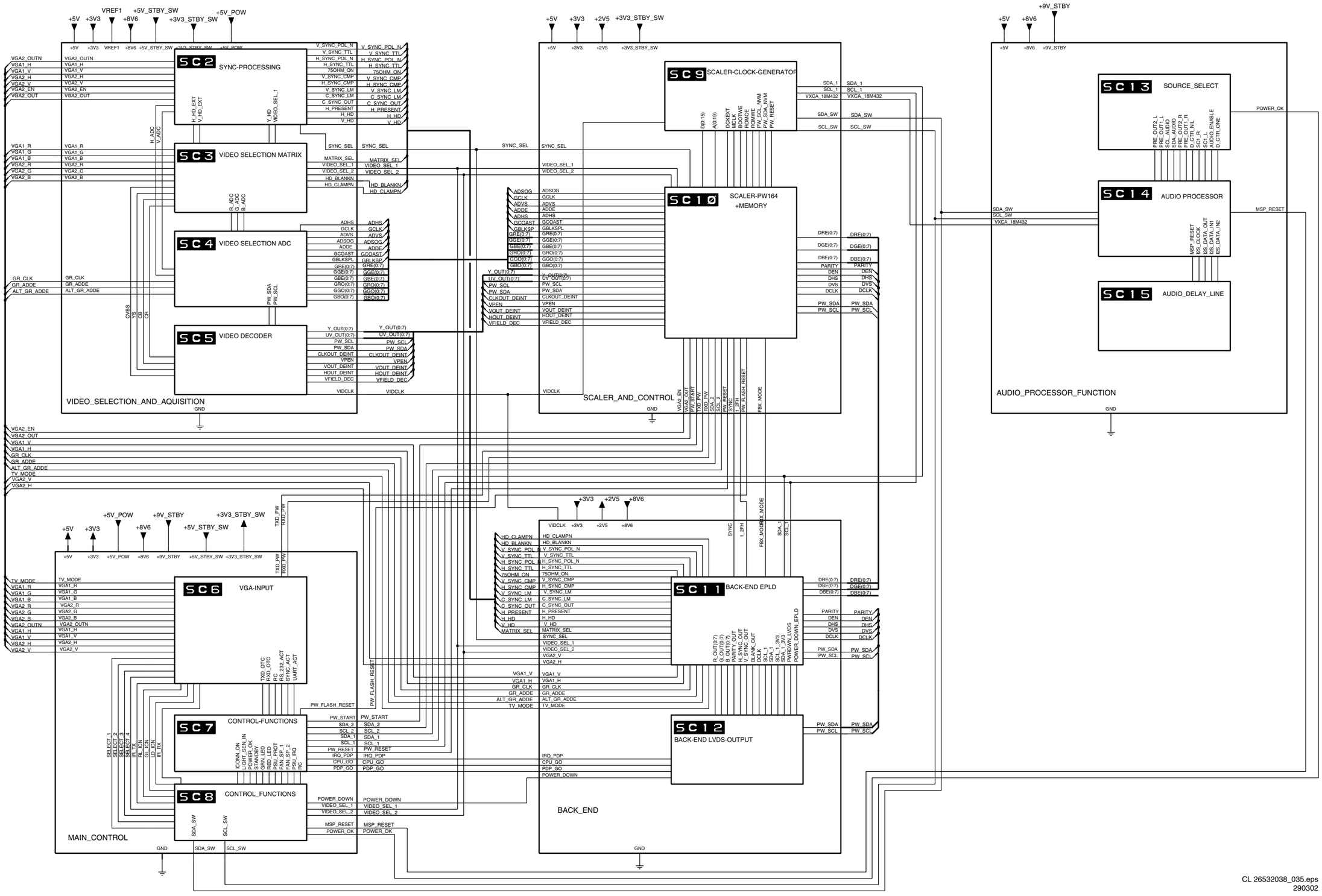


Layout Power Supply Panel (Part 4 Bottom Side)



SCAVIO Panel: Function Blocks and Diagram Connections

SC1 SCAVIO PANEL (FUNCTION BLOCKS AND DIAGRAM CONNECTIONS)



CL 26532038_035.eps
290302

SCAVIO Panel: Sync Selection & Switching

SC2 SYNC SELECTION & SWITCHING

(ENHANCED ONLY, UNLESS INDICATED OTHERWISE)

SC6 10 11

TO SC3 4 6 8 10

SC3

SWITCH

SWITCH

BASIC 4006 RES

BASIC 4007 RES

BASIC 4010

BASIC 4009

SYNC. SLICER

SHIELDING 3.3 1001

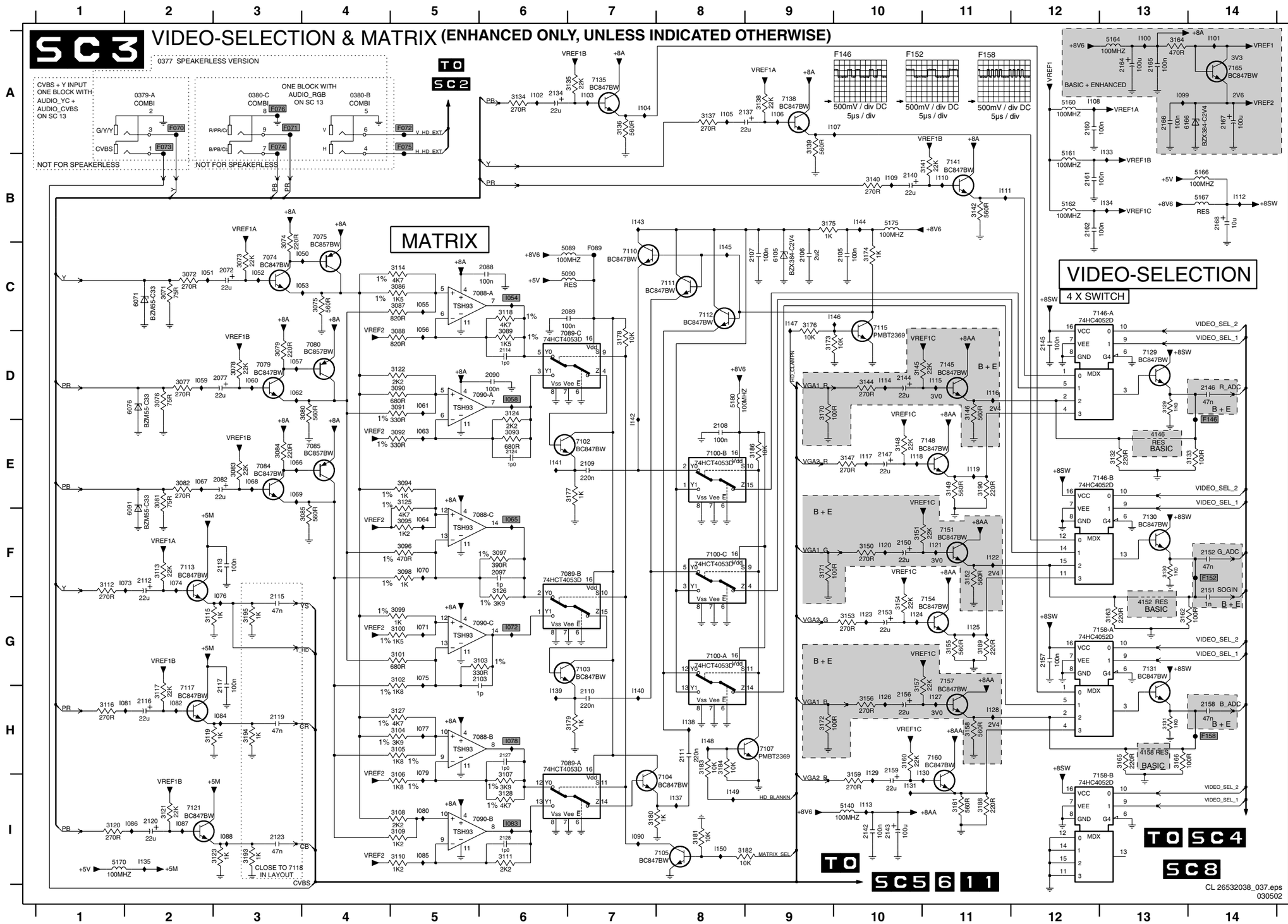
SHIELDING 3.3 1002

SHIELDING 3.3 1003

CL 26532038_036.eps
030502

1001 I7
1002 I8
1003 I8
2000 A3
2001 B4
2002 C5
2003 C6
2004 D2
2005 E2
2007 F11
2008 C5
2009 B12
2012 D5
2014 E6
2015 E5
2020 F5
2021 F4
2022 G4
2030 H4
2034 I4
2040 G8
2041 G8
2042 G9
2060 I10
2061 H13
2066 E14
3000 A4
3001 C2
3002 C5
3003 C5
3004 C5
3005 C6
3006 D2
3007 E10
3008 E6
3010 E2
3011 D4
3012 E4
3013 E5
3014 D6
3015 E2
3019 B10
3020 F4
3021 F4
3022 G4
3023 G4
3024 G4
3025 G6
3026 F6
3030 H4
3031 H4
3032 I4
3033 H4
3034 H4
3035 H6
3036 H6
3040 G7
3041 F8
3042 G8
3043 H8
3044 H7
3050 G11
3051 G10
3052 G12
3053 H12
3054 G12
3060 I12
3061 H13
3065 F13
3066 E13
4006 B8
4007 D8
4009 E13
4010 C13
5000 A3
5007 F11
5009 A12
5020 E5
5060 H10
6001 C1
6007 E9
6010 E1
6019 B9
6022 G5
6034 I5
7000 B4
7001 B5
7002 B6
7006 C2
7007-A A9
7007-B F11
7007-C C9
7009-A A13
7009-B C13
7010 E2
7025-A H5
7025-B F5
7040 G9
7041 G10
7060 I13
7065 F13
I000 A3
I001 F11
I002 A4
I003 B6
I004 B7
I005 C5
I006 C7
I007 C3
I008 D2
I009 D7
I010 D4
I011 D7
I012 E3
I013 E2
I014 E5
I015 F13
I016 F13
I017 F8
I018 F5
I019 F4
I020 F7
I021 F7
I022 G10
I023 G4
I024 G5
I025 G10
I026 G12
I027 H8
I028 H13
I029 H7
I030 H5
I031 H4
I032 H7
I033 H10
I034 H4
I035 H5
I036 H13
I037 I12
I038 A12
I040 D10
I041 A10

SCAVIO Panel: Video Selection & Matrix



0377 A2		
0379-A A2	3134 A6	7158-B I13
0380-B A4	3135 A7	7160 H11
0380-C A3	3136 A7	7165 A14
2072 C3	3137 A8	F070 A2
2077 D3	3138 A9	F071 A3
2082 E3	3139 A9	F072 A5
2088 C6	3140 B10	F073 A2
2089 C7	3141 B11	F074 A3
2090 D6	3142 B11	F075 A5
2097 F6	3144 D10	F076 A3
2103 G6	3145 D10	F089 C7
2105 C10	3146 D11	F146 E14
2106 C9	3147 E10	F152 F14
2107 C9	3148 E10	F158 H14
2108 E8	3149 E11	I050 C4
2109 E7	3150 F10	I051 C2
2110 H7	3151 F10	I052 C3
2111 H8	3152 F11	I053 C4
2112 F2	3153 G10	I054 C6
2113 F3	3154 G10	I055 C5
2114 D6	3155 G11	I056 C5
2115 G3	3156 H10	I057 D3
2116 H2	3157 G10	I058 D6
2117 H3	3158 H11	I059 D2
2119 H3	3159 I10	I060 D3
2120 I2	3160 H10	I061 D5
2123 I3	3161 I11	I062 D3
2124 E6	3162 G13	I063 E5
2127 H6	3163 G13	I064 F5
2128 I6	3164 A13	I065 F6
2134 A6	3165 H13	I066 E3
2137 A9	3166 H13	I067 E2
2140 B10	3170 D9	I068 E3
2142 I10	3171 F9	I069 E3
2143 I10	3172 H9	I070 F5
2144 D10	3173 D9	I071 G5
2145 D12	3174 C10	I072 G6
2146 D14	3175 B9	I073 F2
2147 E10	3176 C9	I074 F2
2150 F10	3177 E7	I075 G5
2151 F14	3178 D7	I076 F3
2152 F14	3179 H7	I077 H5
2153 G10	3180 I7	I078 H6
2156 H10	3181 I8	I079 H5
2157 G12	3182 I9	I080 I5
2158 H14	3183 H8	I081 H2
2159 H10	3184 H8	I082 H2
2160 A12	3186 E9	I083 I6
2161 B12	3188 I11	I084 H3
2162 B12	3189 G11	I085 I5
2164 A13	3190 E11	I086 I2
2165 A13	3193 I3	I087 I2
2166 A13	3194 H3	I088 I3
2167 A14	3195 G3	I090 I7
2168 B14	4146 E13	I099 A13
3071 C2	4152 F13	I100 A13
3072 C2	4158 H13	I101 A14
3073 C3	5089 C7	I102 A6
3074 B3	5090 C7	I103 A7
3075 C4	5140 I10	I104 A7
3076 D2	5160 A12	I105 A8
3077 D2	5161 B12	I106 A9
3078 D3	5162 B12	I107 A10
3079 D3	5164 A13	I108 A12
3080 D4	5166 B14	I109 B10
3081 E2	5167 B14	I110 B11
3082 E2	5170 I1	I111 B11
3083 E3	5175 B10	I112 B14
3084 E3	5180 D8	I113 I10
3085 F4	6071 C2	I114 D10
3086 C5	6076 D2	I115 D11
3087 C5	6091 F2	I116 D11
3088 D5	6105 C9	I117 E10
3089 D6	6166 A14	I118 E10
3090 D5	7074 C3	I119 E11
3091 D5	7075 B4	I120 F10
3092 E5	7079 D3	I121 F11
3093 E6	7080 D4	I122 F11
3094 E5	7084 E3	I123 G10
3095 F5	7085 E4	I124 G10
3096 F5	7088-A C5	I125 G11
3097 F6	7088-B H5	I126 H10
3098 F5	7088-C F5	I127 H11
3099 G5	7089-A H7	I128 H11
3100 G5	7089-B F7	I129 H10
3101 G5	7089-C D7	I130 H11
3102 G5	7090-A D5	I131 I10
3103 G6	7090-B I5	I133 A13
3104 H5	7090-C G5	I134 B13
3105 H5	7100-A G8	I135 I2
3106 I5	7100-B E8	I137 I8
3107 I6	7100-C F8	I138 H8
3108 I5	7102 E7	I139 H6
3109 I5	7103 G7	I140 H7
3110 I5	7104 I8	I141 E6
3111 I6	7105 I8	I142 E7
3112 F1	7107 H9	I143 B7
3113 F2	7110 C7	I144 B10
3114 C5	7111 C8	I145 C8
3115 G2	7112 C8	I146 C10
3116 H1	7113 F2	I147 C9
3117 H2	7115 C10	I148 H8
3118 C6	7117 H2	I149 I8
3119 H2	7121 I2	I150 I8
3120 I1	7129 D13	
3121 I2	7130 F13	
3122 D5	7131 G13	
3123 I3	7135 A7	
3124 D6	7138 A9	
3125 E5	7141 B11	
3126 F6	7145 D11	
3127 H5	7146-A C13	
3128 I6	7146-B E13	
3129 D13	7148 E10	
3130 F13	7151 F11	
3131 H13	7154 G10	
3132 E13	7157 G11	
3133 E14	7158-A G13	

SCAVIO Panel: Video Selection ADC

SC4 VIDEO-SELECTION -ADC (BASIC & ENHANCED VERSION)

TO SC10

FROM TO SC11

(GR_CLK,GR_ADDE,ALT_GR_ADDE,TV_MODE)

7170 AD9887KS

AD-CONVERTER
+TMDS RECEIVER

A/D

CLAMP

SYNC PROCESSING AND CLOCK GENERATION

AND POWER MANAGMENT

TMDS RECEIVER

REF

DDC-EPROM 7215 ST24FC21

TO SC3

FROM SC2

TO SC10

F196 = 3V3
F197 = 5V2

1V / div DC 10µs / div

1V / div DC 5ms / div

DVI INPUT SOCKET 0375

CL 26532038_038.eps 030502

0375 F14 I160 H10
1170 G2 I161 H11
1171 I1 I165 H13
2170 B1 I166 H14
2171 B1
2172 B1
2173 B1
2174 C1
2175 C1
2176 C1
2177 C1
2178 D1
2179 D1
2180 D1
2181 D1
2182 D1
2183 D1
2184 E1
2185 E1
2186 E1
2187 E1
2188 F1
2189 F1
2190 F1
2191 F1
2192 F1
2193 F1
2195 I2
2196 G2
2197 I2
2198 H2
2199 H2
2205 G4
2206 G5
2207 G6
2208 H7
2209 H7
2210 H7
2211 H7
2212 G11
2217 H11
3200 A10
3203 A9
3204 A9
3205 A10
3206 G7
3207 G7
3208 H7
3209 H8
3210 H8
3211 G10
3212 G10
3213 I9
3214 I9
3215 I9
3216 I9
3217 I11
3218 I11
3219 A11
4200 A12
4201 A10
4202 A12
4203 A11
4215 I11
4216 I11
5196 G2
5197 I1
5198 H2
5199 H2
5210 H13
5214 H10
6200 C12
6201 D12
6202 D12
6203 E12
6204 C13
6205 D13
6206 D13
6207 E13
6208 H13
6209 I13
6210 H13
6214 H10
7170 B2
7175 I2
7215 I10
F162 I2
F170 F12
F171 F12
F172 G12
F173 G12
F174 G12
F175 G12
F176 H12
F177 H12
F178 I14
F180 I12
F181 I12
F196 G2
F197 I1
F198 H2
F199 H2
F201 B10
F202 G3
F203 G3
F210 H6
F211 H7
F216 I10
I151 G11
I152 G8
I153 G7
I154 G10
I155 G5
I156 G6
I157 G6
I158 H7
I159 H8

SCAVIO Panel: Video Selection Decoder

SC5 VIDEO-SELECTION-DECODER
(ENHANCED VERSION ONLY)

TO 3D COMB FILTER

VIDEO-DECODER

DE-INTERLACER

TO SC10

FROM SC3

FROM SC9

SVHS

0381 YC Input

7225 SAA7118E

7280 SDA9400

AD-PORT

IIC REGISTER MAP

1ST TASK IIC REG MAP SCALER

2ST TASK IIC REG MAP SCALER

SCALER EVENT CONTROLLER

ANALOG INPUT CONTROL

FAST SWITCH DELAY

COMP PROC

CHROM PROC

COMB FIL

LUM PROC

SYNC

DECODER OUTPUT CONTROL

FIR-PREFILTER PRESCALER BCS-SCALER

LINE FIFO BUFFER

VERTICAL SCALING HORIZONTAL FINE-(PHASE-) SCALING

VIDEO FIFO

OUTPUT FORMATTER I-PORT

VBI DATA SLICER

TEXT FIFO

VIDEO/TEXT ARBITER

AUDIO CLK

X-PORT

H-PORT

BOUNDARY SCAN

ISC INP SYNC CONTROLLER

IFC INPUT FORMAT CONVERSION

LDR VERTICEL NOISE REDUCTION HORIZONTAL DECIMATION

MOTION DETECTOR AND MEASUREMENT

MC MEM CTRL

ED eDRAM INTERFACES

DATA BUFFER

VOLTAGE CONTROL

TEST CTRL

LM LINE MEM

PLL1 CLOCK DOUBLING

OSC OUTP SYNC CONTR.

HDR SCAN RATE CONVERSION

VERTICAL INTERPOLATION

LM LINE MEM

PLL2 CLOCK DOUBLING

OFC OUTPUT FORMAT CONVERSION

I²C-BUS INTERFACE

CL 26532038_039.eps
030502

0381 H3
0387 B1
1250 F4
1270 G5
2220 I6
2221 H6
2222 I6
2223 H6
2224 I6
2225 C2
2226 C2
2228 H5
2230 A5
2231 A5
2232 A6
2240 A6
2247 A6
2248 A7
2249 A7
2250 A7
2252 F4
2253 F4
2254 F5
2260 F2
2261 F3
2262 F2
2263 F3
2264 F2
2265 F3
2266 G2
2267 G3
2268 G2
2269 G3
2270 G2
2274 G1
2275 G1
2276 G1
2277 H3
2278 H4
2279 H4
2280 B11
2281 B11
2282 B11
2283 B11
2284 B12
2285 B12
2286 B12
2287 B12
2288 B12
3220 B1
3225 C3
3250 B8
3251 B8
3260 F3
3261 F6
3262 E8
3263 E8
3271 G3
3274 H1
3275 H2
3276 H2
3277 H3
3278 H4
3279 H4
3284 F9
3285 F10
3286-A D13
3286-B C13
3286-C C13
3289-A D13
3289-B D13
3289-C D13
3289-D D13
3290-A D13
3290-B E13
3290-C E13
3290-D E13
3291-A E13
3291-B E13
3291-C E13
3291-D F13
3292-A F13
3292-B F13
3292-C F13
3292-D F13
3293 F13
4250 G4
5220 I5
5221 H5
5222 I5
5223 H5
5224 I5
5226 F5
5228 H5
6274 I1
6276 I2
6277 I2
6278 I2
7225 C3
7280 C10
F220 I6
F221 H6
F222 I6
F223 H6
F224 I6
F225 B1
F226 B1
F227 B1
F228 B1
F229 C1
F230 C1
F231 C1
F232 C1
F233 C1
F234 H3
F235 I2
F236 I2
F237 H6
F240 C9
F241 C9
F242 D9
F245 C14
F246 C14
F247 D14
F249 F13
F250 B7
F251 B7
F260 E2
F261 E6
F262 E6
F263 E6
F264 E6
F265 F6
I200 I2
I201 H4
I202 H4
I203 F5
I204 H7
I205 F3
I206 E8
I207 F5

SCAVIO Panel: VGA Input

SC6

VGA INPUT

(BASIC & ENHANCED VERSION)

TO 0318 VGA

VGA PANEL CONNECTOR

TO SC7 8 10

FROM SC 10 11

RS232 DOWN-CONVERTER

4:1 SWITCH

4:1 SWITCH

VGA OUTPUT BUFFERS

1 SHOT

1 SHOT

TO SC8

TO SC7

CL 26532038_040.eps 030502

F303 200mV / div DC 5µs / div

F304 200mV / div DC 5µs / div

F305 200mV / div DC 5µs / div

F306 1V / div DC 5µs / div

F307 2V / div DC 5ms / div

F308 2V / div DC 2µs / div

F309 2V / div DC 200µs / div

F311 1V / div DC 5µs / div

F312 2V / div DC 10µs / div

F313 1V / div DC 5µs / div

F314 1V / div DC 5µs / div

F315 1V / div DC 5ms / div

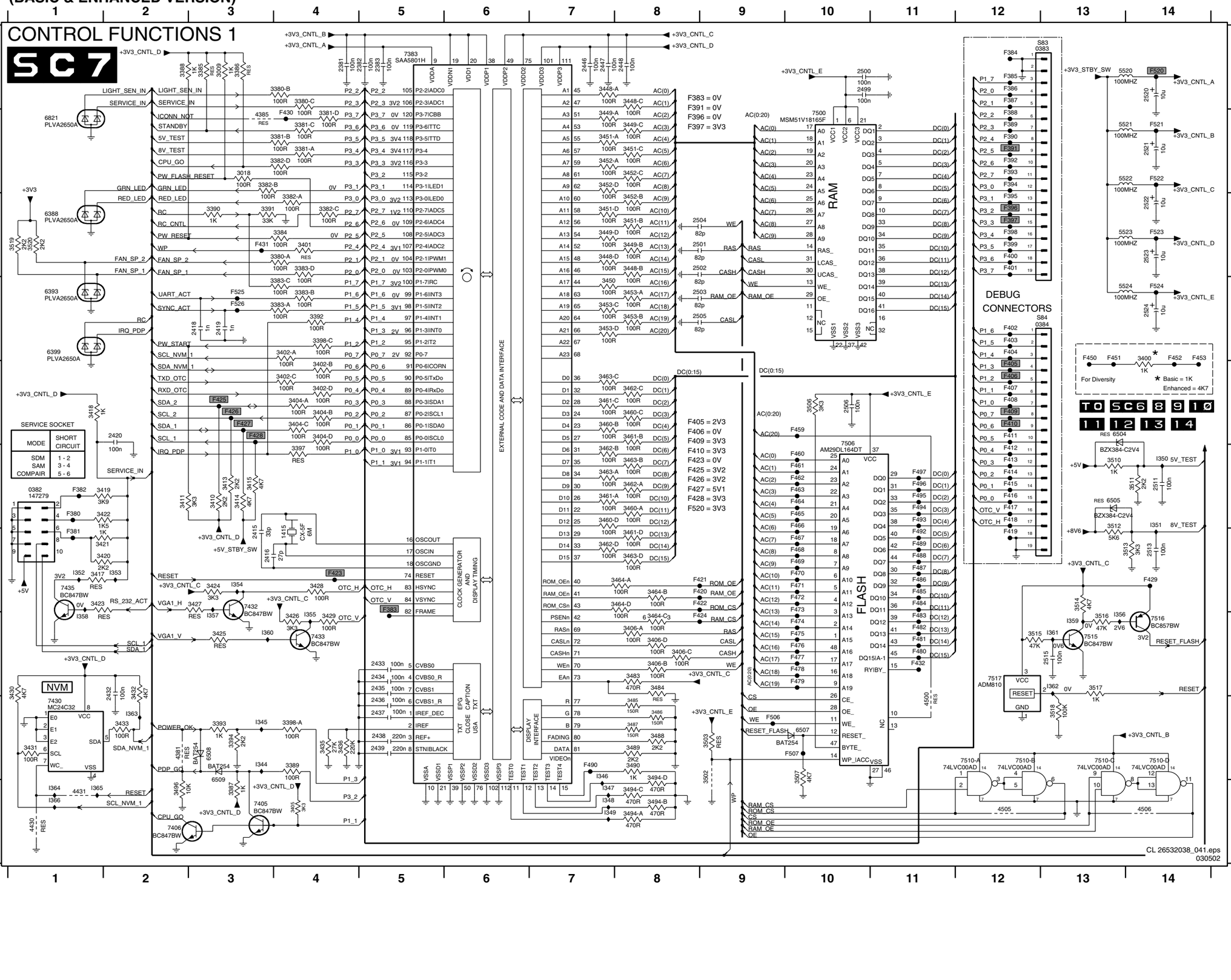
0318 C1 3901 D7 F318 G2
0376 B14 3902 E6 F319 H2
2300 B1 3903 G6 F320 C12
2301 B2 3904 I6 F321 C14
2302 B2 3905 F4 F322 C13
2304 B4 3906 G4 F323 H2
2305 B3 3907 I4 F324 G2
2306 D3 3908 B4 F325 A4
2308 E3 3909 H10 F326 B5
2310 A4 3910 A4 F327 C14
2311 E6 3911 A4 F328 C14
2318 G3 3912 A5 F329 C14
2328 I3 3913 C9 F330 C14
2335 H10 3914 C7 F331 D14
2336 H2 3915 D7 I218 C7
2337 I2 3917 B4 I219 E8
2338 J1 3918 J10 I220 A3
2340 B8 3919 I11 I221 A12
2341 C6 3920 G10 I222 B12
2343 C10 3922 D8 I223 B10
2345 D6 3923 D5 I224 B4
2351 C11 3924 D14 I225 B10
2352 D11 3925 D14 I226 B9
2353 B12 3926 D14 I227 B11
2354 B12 3927 E14 I228 B8
2355 D12 3928 E14 I229 C8
2356 D12 4008 E8 I230 C6
2365 F12 4011 A8 I231 C7
2370 G10 4315 E7 I232 C6
2372 G12 4316 D5 I233 C12
2375 H12 4325 G7 I234 C12
2376 I11 4335 I7 I235 C13
3294 D6 4898 C5 I236 D9
3295 D6 5300 B1 I237 D10
3296 D7 5302 B2 I238 D8
3297 F6 5350 B12 I239 D6
3298 H6 5352 B11 I240 D7
3299 J6 6302 B1 I241 D6
3300 F5 6310 A3 I242 E7
3301 H6 6311 B4 I243 E4
3302 H7 6315 F13 I244 E3
3303 H8 6316 G13 I245 E10
3304 G8 6317 F13 I246 E12
3305 I2 6318 G13 I247 E4
3306 J5 6319 F13 I248 E5
3307 C6 6320 G13 I249 E10
3308 E3 6321 F13 I250 F6
3309 E4 6322 G13 I251 F7
3310 F4 6323 F14 I252 F9
3311 E5 6324 G14 I253 F6
3312 F5 6353 A12 I254 F5
3313 F5 6354 C12 I255 F7
3314 F6 6355 C13 I256 F11
3315 E6 6356 D12 I257 F11
3316 H5 6357 D13 I258 F5
3317 D6 6365 F12 I259 G7
3318 G3 6366 F12 I260 G4
3319 G4 6378 I10 I261 G6
3320 H4 6379 I10 I262 G7
3321 G5 6380 C7 I263 G6
3322 H5 6381 D7 I264 G6
3323 H6 7303-A B4 I265 G7
3324 H6 7303-B B3 I266 G6
3325 G6 7303-C D4 I267 G6
3326 C6 7303-D C4 I268 H5
3327 C6 7305 G7 I269 H6
F 3328 I3 7306 H7 I270 H10
3329 I4 7307 G8 I271 H7
3330 I4 7308 E4 I272 H5
3331 I5 7309 F5 I273 H9
3332 I5 7310 A4 I274 H11
3333 J5 7311-A E6 I275 H12
3334 J6 7311-B G6 I276 I7
3335 I6 7311-C I6 I277 I1
3336 I2 7315 C6 I278 I4
3337 I1 7316 C7 I279 I2
3338 I2 7318 G4 I280 I3
3339 J2 7319 H5 I281 I10
3340 C7 7320 I1 I282 I4
3341 B9 7321 J1 I283 I5
3342 B9 7322 I2 I284 I2
3343 B10 7323 I2 I285 I6
3344 B10 7325 D6 I286 I7
3345 A10 7326 D7 I287 I6
3346 D7 7328 I4 I288 I5
3347 E10 7333 J5 I289 I1
3348 C7 7340-A B8 I290 J2
3349 C7 7340-B C8 I291 J7
3350 D10 7341 B9 I292 J9
3351 I8 7343 B10 I293 J10
3352 B11 7352 B11 I294 J5
3353 C12 7356 F7 I295 C6
3354 C12 7357 F7 I296 D5
3355 C12 7358 E8 I297 F13
3356 F6 7360 F10 I298 F13
3357 F7 7362 E10 I299 F13
3358 F8 7364 F11 I300 F14
3359 F8 7365 I7 I301 F14
3360 F9 7366 I7
3361 E10 7367 I8
3362 E10 7370-A H13
3363 H2 7370-B G11
3364 F11 F300 B2
3365 F12 F301 B2
3366 E12 F303 D2
3367 I6 F304 D2
3368 J7 F305 D2
3369 I8 F306 D2
3370 G10 F307 E2
3371 H10 F308 E2
3372 D5 F309 E2
3373 I10 F310 E2
3374 H11 F311 F2
3375 H12 F312 F2
3376 I12 F313 F2
3377 I12 F314 G2
3378 J10 F315 G2
3379 J10 F316 G2
3900 I1 F317 G2

SCAVIO Panel: Control Functions 1

(BASIC & ENHANCED VERSION)

CONTROL FUNCTIONS 1

SC7



0382 F1	3452-D B7	F415 F12
0383 A12	3453-A D8	F416 F12
0384 D12	3453-B D8	F417 F12
1415 G4	3453-C D7	F418 F12
2381 A4	3453-D D7	F419 G12
2382 A5	3460-A F8	F420 G9
2383 A5	3460-B E7	F421 G9
2415 G3	3460-C E8	F422 G9
2416 G3	3460-D F7	F423 G4
2418 D3	3461-A F7	F424 H9
2419 D3	3461-B E8	F425 E3
2420 E2	3461-C E7	F426 E3
2432 H2	3461-D G8	F427 E3
2433 H5	3462-A F8	F428 E3
2434 H5	3462-B F7	F429 G14
2435 H5	3462-C E8	F430 B4
2436 I5	3462-D G7	F431 C3
2437 I5	3463-A F7	F432 H11
2438 I5	3463-B F8	F450 D13
2439 I5	3463-C E7	F451 D13
2446 A7	3463-D G8	F452 D14
2447 A7	3464-A G8	F453 D14
2448 A8	3464-B G8	F459 E10
2499 A10	3464-C H8	F460 F10
2500 A10	3464-D G8	F461 F10
2501 C8	3483 H8	F462 F10
2502 C8	3484 H8	F463 F10
2503 D8	3485 I8	F464 F10
2504 C8	3486 I8	F465 F10
2505 D8	3487 I8	F466 F10
2506 E10	3488 I8	F467 G10
2511 F14	3489 I8	F468 G10
2513 G14	3490 I8	F469 G10
2515 H13	3494-A J8	F470 G10
2520 A14	3494-B J8	F471 G10
2521 B14	3494-C J8	F472 G10
2522 C14	3494-D I8	F473 G10
2523 C14	3496 J2	F474 H10
2524 D14	3502 I9	F475 H10
3009 A3	3503 I9	F476 H10
3018 B3	3506 E10	F477 H10
3380-A C4	3507 I10	F478 H10
3380-B A4	3510 F13	F479 H10
3380-C A4	3511 F14	F480 H11
3381-A B4	3512 F13	F481 H11
3381-B B4	3513 G14	F482 H11
3381-C B4	3514 G13	F483 H11
3381-D B4	3515 H12	F484 G11
3382-A C4	3516 H13	F485 G11
3382-B B3	3517 H13	F486 G11
3382-C C4	3518 I13	F487 G11
3382-D B4	3519 C1	F488 G11
3383-A D4	3520 C1	F489 G11
3383-B D4	4381 I2	F490 I7
3383-C D4	4385 B3	F492 G11
3383-D C4	4430 J1	F493 F11
3384 C4	4431 J1	F494 F11
3385 A3	4500 I11	F495 F11
3386 A3	4505 J12	F496 F11
3387 J3	4506 J14	F497 F11
3388 A2	5520 A13	F500 I9
3389 I4	5521 B13	F507 I10
3390 C3	5522 B13	F520 A14
3391 C3	5523 C13	F521 B14
3392 D4	5524 D13	F522 B14
3393 I3	6388 C1	F523 C14
3394 I3	6393 D1	F524 D14
3397 F4	6399 D1	F525 D3
3398-A I4	6504 E13	F526 D3
3398-C D4	6505 F13	I344 I3
3400 D14	6507 I10	I345 I3
3401 C4	6508 I3	I346 I7
3402-A D4	6509 J3	I347 J7
3402-B E4	6821 B1	I348 J7
3402-C E4	7383 A5	I349 J7
3402-D E4	7405 J3	I350 F14
3404-A E4	7406 J2	I351 F14
3404-B E4	7430 I1	I352 G1
3404-C E4	7432 G3	I353 G2
3404-D E4	7433 H4	I354 G3
3405 J4	7435 G1	I355 H4
3406-A H8	7500 B10	I356 H13
3406-B H8	7506 F10	I357 H3
3406-C H8	7510-A I12	I358 H1
3406-D H8	7510-B I12	I359 H13
3410 F3	7510-C I13	I360 H3
3411 F2	7510-D I14	I361 H13
3413 F3	7515 H13	I362 I2
3414 F3	7516 H14	I363 I2
3415 F3	7517 H12	I364 J1
3417 G1	F380 F1	I365 J1
3418 E1	F381 G1	I366 J1
3419 F2	F382 F1	
3420 G2	F383 G5	
3421 G1	F384 A12	
3422 F2	F385 A12	
3423 G1	F386 A12	
3424 G3	F387 A12	
3425 H3	F388 B12	
3426 H4	F389 B12	
3427 G3	F390 B12	
3428 G4	F391 B12	
3429 H4	F392 B12	
3430 H1	F393 B12	
3431 I1	F394 B12	
3432 H2	F395 C12	
3433 I2	F396 C12	
3435 I4	F397 C12	
3436 I4	F398 C12	
3448-A A7	F399 C12	
3448-B C8	F400 C12	
3448-C A8	F401 C12	
3448-D C7	F402 D12	
3449-A B7	F403 D12	
3449-B C8	F404 D12	
3449-C B8	F405 E12	
3449-D C7	F406 E12	
3450 D7	F407 E12	
3451-A B7	F408 E12	
3451-B C8	F409 E12	
3451-C B8	F410 E12	
3451-D C7	F411 E12	
3452-A B7	F412 F12	
3452-B C8	F413 F12	
3452-C B8	F414 F12	

SCAVIO Panel: Control Functions 2

SC8 CONTROL FUNCTIONS 2
(BASIC & ENHANCED VERSION)

F540 = 5V
F541 = 3V3
F546 = 9V
F547 = 9V
F549 = 5V
F550 = 3V3

TO 0320 LD LED-PANEL DISPLAY

TO 0305 P7 POWER SUPPLY

TO 0319 P3 POWER SUPPLY

EXTERNAL ADC

I/O EXPANDER

TO SC3 6 7 9 10 12 13 14

CL 26532038_042.eps 030502

0305 C2
0315 H5
0316 I5
0319 E2
0320 B2
1100 C3
1105 F3
2530 C8
2531 C6
2533 G5
2534 G6
2535 F5
2537 D2
2538 D3
2541 C9
2546 C3
2547 C3
2548 C3
2550 A3
2551 A3
2552 A3
2553 A4
2554 H10
2555 F10
2557 H4
2558 G4
2559 H3
2560 G3
2562 H2
2563 H2
2564 H2
2565 I2
2566 I2
3530 C7
3531 E7
3532 E7
3533 G5
3534 G6
3535 F5
3536 F4
3537 H5
3538 I5
3539 H5
3540 B9
3541 B9
3542 B12
3543 A12
3544 B13
3545 G3
3546 C13
3547 C13
3548 D14
3549 I5
3550 B3
3551 B3
3552 B3
3553 B3
3554 G5
3555 G6
3556 E9
3557 G3
3558 G3
3559 G3
3560 G3
3561 C13
3562 D13
3563 C13
3564 B14
3565 C14
3566 C13
3567 C13
3568 D7
3569 E7
3570 F9
3572 E7
3573 D7
5530 C5
5541 C9
6551 H13
6552 H13
6553 G13
6554 F13
6555 E13
7530 D6
7540 A10
7550-A I12
7550-B H10
7555-A F10
7555-B E12
7555-C G12
7563 D14
F527 C12
F528 B12
F529 D2
F530 B2
F531 B2
F532 B2
F533 B2
F534 B2
F535 B2
F536 C2
F537 C2
F538 C2
F539 C2
F540 C3
F541 E2
F542 E2
F543 E2
F544 E2
F545 D2
F546 E2
F547 F2
F548 F2
F549 F2
F550 F2
F551 F2
F552 F2
F553 G2
F554 G2
F555 G2
F556 G2
F557 G2
F558 H5
F559 H5
F560 I5
F561 I5
F562 F2
I400 C2
I401 C7
I402 C7
I403 D7
I405 D6
I406 D6
I407 D5
I408 D14
I409 D13
I410 F10
I411 G9
I412 G9
I413 H9
I414 I12
I415 D8
I416 H12
I417 G12
I418 G12
I419 F12
I420 F12

SCAVIO Panel: Scaler Clock Generator

SC9 SCALER-CLOCK-GENERATOR
(BASIC & ENHANCED VERSION)

F563 2V / div DC 50µs / div
F564 2V / div DC 100µs / div
F565 1V / div DC 20ns / div
F566 1V / div DC 20ns / div
F567 = 3V2
F569 = 3V2

CLOCK GENERATOR

TO SC5 {VIDCLK}

TO SC10 14

TO SC8 SC14

TO SC7

SCL_SW SDA_SW SDA_1 SCL_1

+5V_0E +5V +3V3_STBY_SW +3V3_PW +3V +5V_STBY_SW

5572 100MHZ 5574 100MHZ 3575 1K 3580 4K7 3581 100R 3582 100R 3583 4K7 3016 100R 3571 100R 3591 3K3 3592 3K3 3593 3K3 3594 4K7 2581 100n 1575 F 500mA L 32V 441

I432 I430 I431 I433 I435 I436

2573 10u 2572 100n 2574 100n 2584 100n 2583 100n 2570 1n 5570 10u 1570 CX-11F 24M576

4572 4574 4581 RES 4582 RES 4591 RES 4592 RES 4593 RES

7570 FS6377 XIN XOUT PD SCL SDA ADDR SEL_CD OE VDD VSS REF OSC PWR DWN CTRL I²C BUS INTERF PLL A PLL B PLL C MUX A MUX B MUX C MUX D

7574-A 74LVC125A 7574-B 74LVC125A 7574-C 74LVC125A 7574-D 74LVC125A

VIDCLK 24.576MHz F566 VXCA_18M432 F565 MCLK 120MHz F563 DCKEXT 36MHz F564

PW-NVM 7580 M24C32 E0 E1 E2 SCL WC_ VCC SDA VSS

F567 F568 F569 PW_SCL_NVM PW_RESET PW_SDA_NVM

TO SC10

7571-A 74HCT4053D 7571-B 74HCT4053D 7571-C 74HCT4053D Vdd Vee Vss

6500 RES 6501 RES 6502 RES 6503 BZX384-C2V4

S86 0386 FTR

F570 F571 F572 F573 F574 F575 F576 F577 F578 F579 F580 F581 F582 F583 F584 F585 F586 F587 F588 F589 F590 F591 F592 F593 F594 F595 F596 F597 F598 F599 F600 F601 F602 F603 F604 F605 F606 F607 F608 F609 F610 F611 F612 F613

A(0:19) A(2) A(4) A(6) A(9) A(11) A(12) A(14) A(17) A(19) A(1) A(3) A(5) A(7) A(8) A(10) A(13) A(15) A(16) A(18)

D(0:15) D(15) D(14) D(5) D(4) D(3) D(2) D(9) D(8) D(7) D(6) D(13) D(12) D(11) D(10) D(1) D(0)

BOOTWE ROMOE {ROMWE} ROMWE +3V3

DEBUG CONNECTOR PW

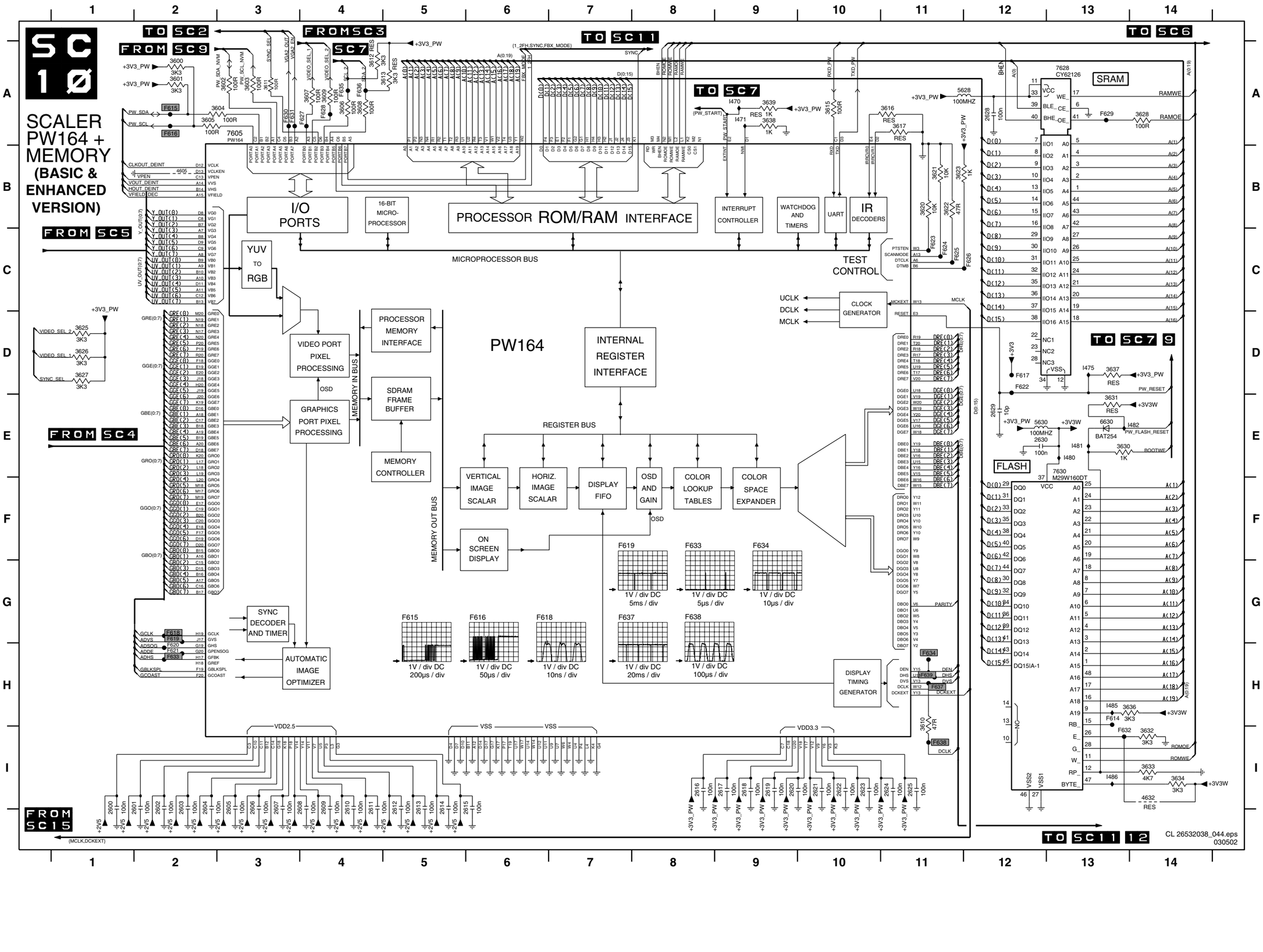
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0386 C9
1570 C2
1575 G6
2570 D2
2572 C4
2573 C4
2574 C6
2581 H2
2583 F5
2584 F1
3016 D3
3571 D2
3575 E3
3580 F3
3581 G3
3582 F5
3583 F5
3590 D10
3591 D10
3592 E10
3593 E10
3594 H2
4572 C6
4574 D7
4581 G3
4582 G4
4591 C10
4592 G1
4593 E2
5570 C2
5572 B3
5574 B5
6500 G1
6501 G1
6502 G1
6503 H1
7570 C3
7571-A G2
7571-B F2
7571-C E3
7574-A C6
7574-B D6
7574-C D6
7574-D E6
7580 F4
F563 E7
F564 E7
F565 D7
F566 B7
F567 G3
F568 G3
F569 G5
F570 C8
F571 C8
F572 C8
F573 C8
F574 C8
F575 D8
F576 D8
F577 D8
F578 D8
F579 D8
F580 D8
F581 E8
F582 E8
F583 E8
F584 E8
F585 F8
F586 F8
F587 F8
F588 F8
F589 F8
F590 F8
F591 C10
F592 C10
F593 C10
F594 C10
F595 C10
F596 D10
F597 D9
F598 D9
F599 D10
F600 D10
F601 D10
F602 D10
F603 E10
F604 E10
F605 E10
F606 E10
F607 E10
F608 E10
F609 F10
F610 F10
F611 F10
F612 F10
F613 F10
I430 C3
I431 D3
I432 B4
I433 D2
I435 H1
I436 H1

SCAVIO Panel: PW Scaler and Memory

SC10

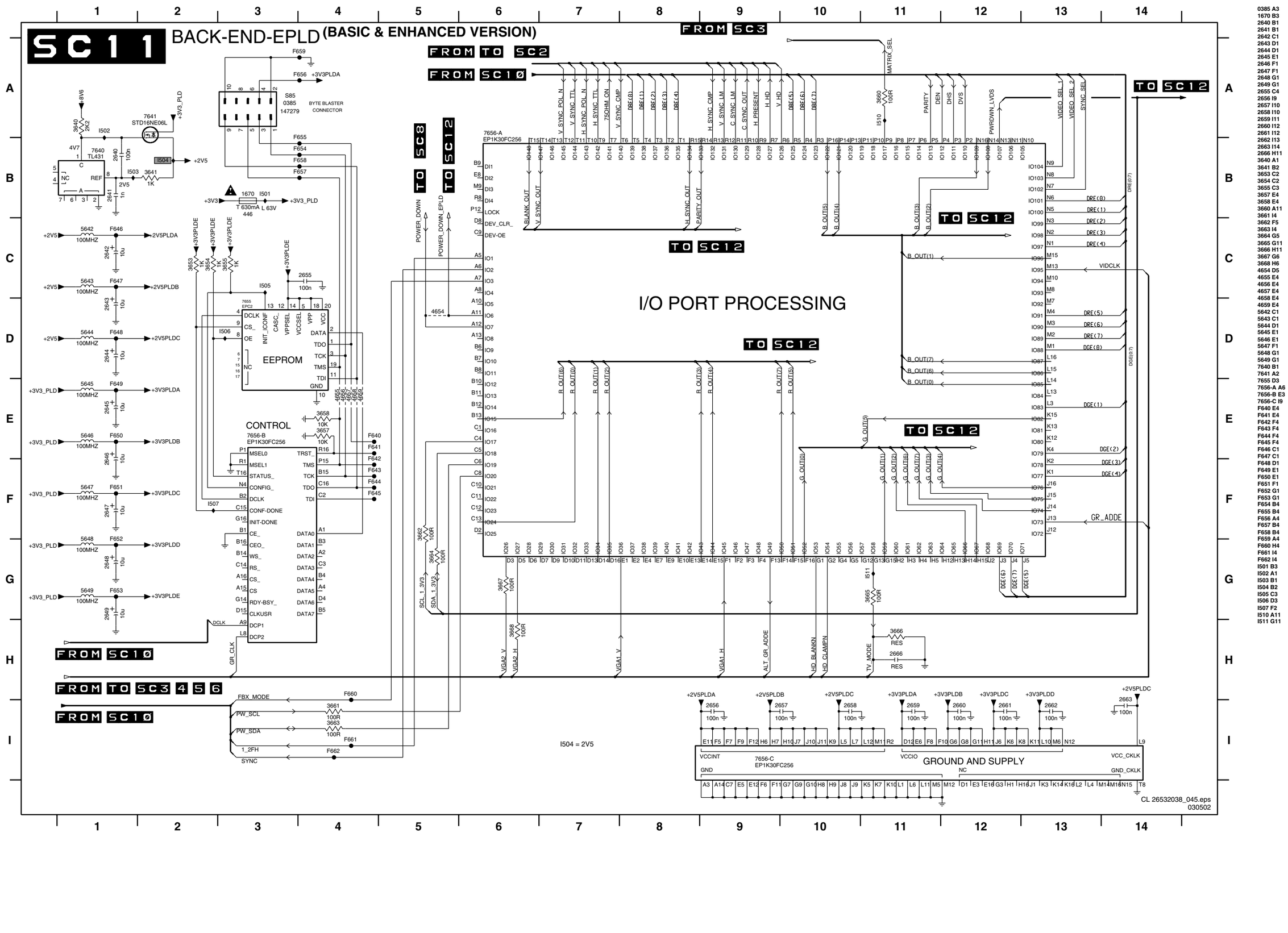
SCALER PW164 + MEMORY (BASIC & ENHANCED VERSION)



2600 I1
2601 I2
2602 I2
2603 I2
2604 I2
2605 I3
2606 I3
2607 I3
2608 I4
2609 I4
2610 I4
2611 I4
2612 I5
2613 I5
2614 I5
2615 I6
2616 I8
2617 I9
2618 I9
2619 I9
2620 I9
2621 I10
2622 I10
2623 I10
2624 I11
2625 I11
2628 A12
2629 E12
2630 E12
3600 A2
3601 A2
3602 A3
3603 A3
3604 A3
3605 A2
3606 A4
3607 A4
3608 A4
3609 A4
3610 H11
3611 A3
3612 A4
3613 A5
3615 A10
3616 A11
3617 A11
3620 B11
3621 B11
3622 B11
3623 B11
3625 D1
3626 D1
3627 D1
3628 A14
3630 E13
3631 E13
3632 I14
3633 I14
3634 I14
3636 H14
3637 D13
3638 A9
3639 A9
4605 B2
4632 I14
5628 A12
5630 E12
6630 E13
7605 A3
7628 A13
7630 E13
F614 H13
F615 A2
F616 A2
F617 D12
F618 G2
F619 G2
F620 H2
F621 H2
F622 D12
F623 C11
F624 C11
F625 C11
F626 C12
F627 A4
F628 A4
F629 A13
F630 A3
F631 A3
F632 I13
F633 H2
F634 H11
F635 A4
F636 A4
F637 H11
F638 I11
F639 H11
I470 A9
I471 A9
I475 D13
I480 E13
I481 E13
I482 E14
I485 H13
I486 I13

SCAVIO Panel: Back-End EPLD

SC11 BACK-END-EPLD (BASIC & ENHANCED VERSION)



0385 A3
1670 B3
2640 B1
2641 B1
2642 C1
2643 D1
2644 D1
2645 E1
2646 F1
2647 F1
2648 G1
2649 G1
2655 C4
2656 I9
2657 I10
2658 I10
2659 I11
2660 I12
2661 I12
2662 I13
2663 I14
2666 H11
3640 A1
3641 B2
3653 C2
3654 C2
3655 C3
3657 E4
3658 E4
3660 A11
3661 I4
3662 F5
3663 I4
3664 G5
3665 G11
3666 H11
3667 G6
3668 H6
4654 D5
4655 E4
4656 E4
4657 E4
4658 E4
4659 E4
5642 C1
5643 C1
5644 D1
5645 E1
5646 E1
5647 F1
5648 G1
5649 G1
7640 B1
7641 A2
7655 D3
7656-A A6
7656-B E3
7656-C I9
F640 E4
F641 E4
F642 F4
F643 F4
F644 F4
F645 F4
F646 C1
F647 C1
F648 D1
F649 E1
F650 E1
F651 F1
F652 G1
F653 G1
F654 B4
F655 B4
F656 A4
F657 B4
F658 B4
F659 A4
F660 H4
F661 I4
F662 I4
I501 B3
I502 A1
I503 B1
I504 B2
I505 C3
I506 D3
I507 F2
I510 A11
I511 G11

SCAVIO Panel: Back-End LVDS Output

SC12 BACK-END-LVDS-OUTPUT
(BASIC & ENHANCED VERSION)

LVDS ENCODER

FROM SC8

FROM SC9

TO SC11

TO SC7

TO SC11

TO SC10

7670 DS90C385MTD

TTL PARALLEL-TO-LVDS

S01 PDP INTERFACE CONNECTOR

DF13 0301

+3V3_PW

+3V3_STBY_SW

+5V_STBY_SW

SCL_1_3V3

SDA_1_3V3

SCL_1

SDA_1

CPU_GO

PDP_GO

IRQ_PDP

POWER_DOWN_EPLD

PW_SCL

PW_SDA

F690

F691

F692

500mV /div DC
10µs / div

500mV /div DC
5ms / div

500mV /div DC
10µs / div

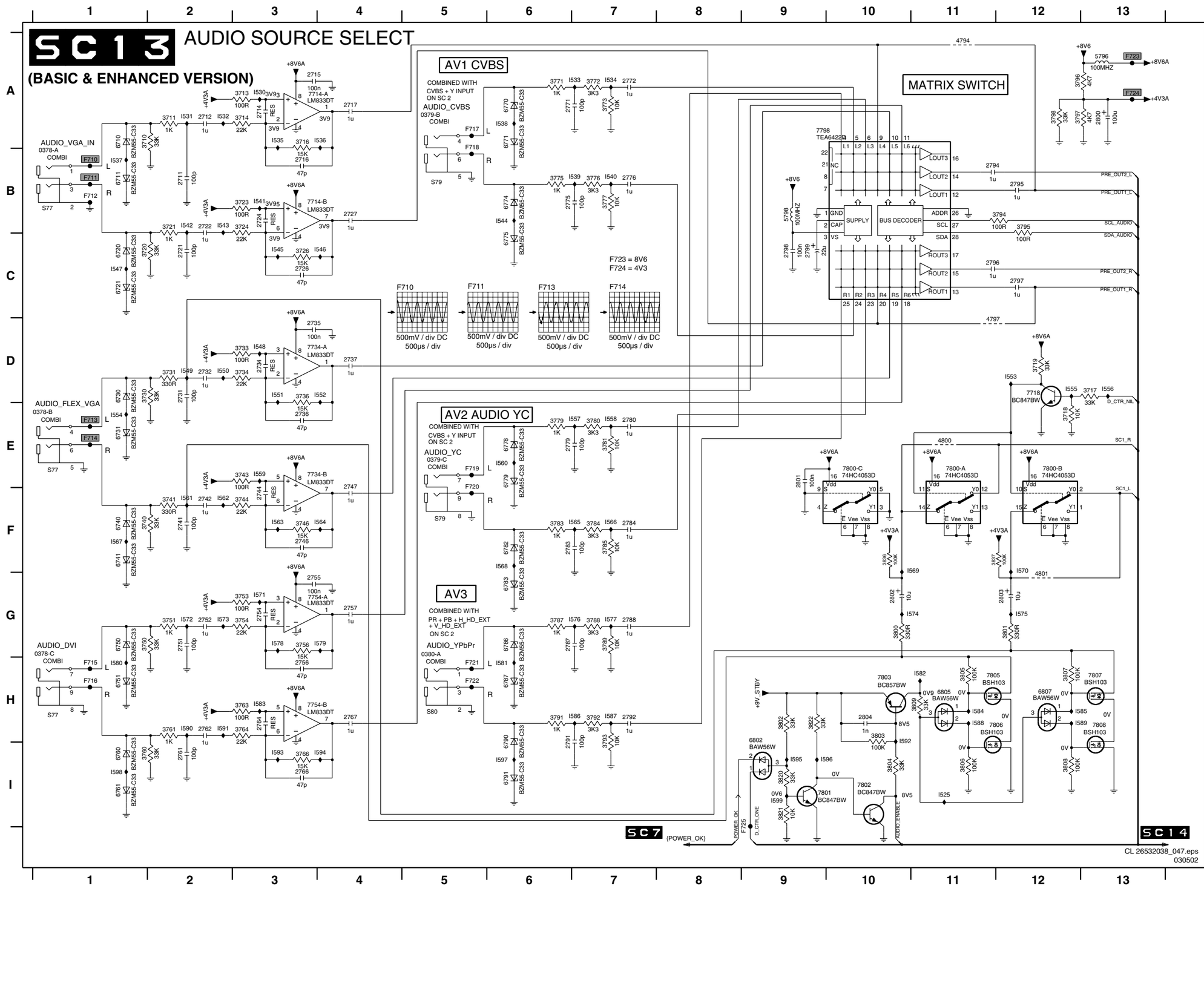
CL 26532038_046.eps
030502

0301 E9
2670 B5
2671 B5
2672 B5
2673 B6
2674 B6
2694 F11
2695 F11
2696 F11
2697 F11
2698 F12
2699 F12
3670 F10
3671 D11
3672 D11
3673 C6
3674 E10
3675 G4
3676 E11
3677 E10
3679 G4
3681 B10
3682 B11
3685 A10
3686 A10
3687 F11
3688 A11
3689 B11
4680 C10
4684 B10
5670 B5
5672 B5
5673 B6
7670 B4
7675 A11
7676 B11
F670 D9
F671 D9
F672 D9
F673 D9
F674 D9
F675 E9
F676 E9
F677 E9
F678 E9
F679 E9
F680 D10
F681 D10
F682 E10
F683 E10
F684 E10
F685 E10
F686 E10
F690 F4
F691 F4
F692 G4
I680 A11
I681 B11
I682 B9
I683 C9
I685 C6

SCAVIO Panel: Audio Source Select

SC13 AUDIO SOURCE SELECT

(BASIC & ENHANCED VERSION)



0378-A A1	3800 G10	I565 F7	
0378-B E1	3801 G12	I566 F7	
0378-C G1	3802 H9	I567 F1	
0379-B A5	3803 H10	I568 F6	
0379-C E5	3804 I10	I569 F11	
0380-A G5	3805 H11	I570 F12	
2711 B2	3806 I11	I571 G3	
2712 A2	3807 H12	I572 G2	
2714 A3	3808 I12	I573 G2	
2715 A3	3809 H11	I574 G11	
2716 B3	3820 I9	I575 G12	
2717 A4	3821 I9	I576 G7	
2721 C2	3822 H9	I577 G7	
2722 B2	3836 F10	I578 G3	
2724 B3	3837 F11	I579 G4	
2726 C3	4794 A11	I580 H1	
2727 B4	4797 D11	I581 H6	
2731 D2	4800 E11	I582 H11	
2732 D2	4801 G12	I583 H3	
2734 D3	5796 A13	I584 H11	
2735 D3	5798 B9	I585 H13	
2736 E3	6710 A1	I586 H7	
2737 D4	6711 B1	I587 H7	
2741 F2	6720 C1	I588 H11	
2742 F2	6721 C1	I589 H13	
2744 F3	6730 D1	I590 H2	
2746 F3	6731 E1	I591 H2	
2747 F4	6740 F1	I592 H10	
2751 G2	6741 F1	I593 I3	
2752 G2	6750 G1	I594 I4	
2754 G3	6751 H1	I595 I9	
2755 G3	6760 I1	I596 I10	
2756 H3	6761 I1	I597 I6	
2757 G4	6770 A6	I598 I1	
2761 I2	6771 A6	I599 I9	
2762 H2	6774 B6		
2764 H3	6775 C6		
2766 I3	6778 E6		
2767 H4	6779 E6		
2771 A6	6782 F6		
2772 A7	6783 G6		
2775 B6	6786 G6		
2776 B7	6787 H6		
2779 E6	6790 H6		
2780 E7	6791 I6		
2783 F6	6802 I9		
2784 F7	6805 H11		
2787 G6	6807 H12		
2788 G7	7714-A A3		
2791 H6	7714-B B3		
2792 H7	7718 D12		
2794 B11	7734-A D3		
2795 B12	7734-B E3		
2796 C11	7754-A G3		
2797 C12	7754-B H3		
2798 C9	7798 A9		
2799 C9	7800-A E11		
2800 A13	7800-B E12		
2801 E9	7800-C E10		
2802 G10	7801 I9		
2803 G12	7802 I10		
2804 H10	7803 H10		
3710 A1	7805 H11		
3711 A2	7806 H12		
3713 A3	7807 H13		
3714 A3	7808 H13		
3716 A3	F710 B1		
3717 D13	F711 B1		
3718 E12	F712 B1		
3719 D12	F713 E1		
3720 C1	F714 E1		
3721 B2	F715 H1		
3723 B3	F716 H1		
3724 B3	F717 A5		
3726 C3	F718 B5		
3730 D1	F719 E5		
3731 D2	F720 F5		
3733 D3	F721 H5		
3734 D3	F722 H5		
3736 D3	F723 A13		
3740 F1	F724 A13		
3741 F2	F725 I9		
3743 E3	I525 I11		
3744 F3	I530 A3		
3746 F3	I531 A2		
3750 G1	I532 A2		
3751 G2	I533 A7		
3753 G3	I534 A7		
3754 G3	I535 A3		
3756 G3	I536 A4		
3760 I1	I537 B1		
3761 H2	I538 A6		
3763 H3	I539 B7		
3764 H3	I540 B7		
3766 I3	I541 B3		
3771 A6	I542 B2		
3772 A7	I543 B2		
3773 A7	I544 B6		
3775 B6	I545 C3		
3776 B7	I546 C4		
3777 B7	I547 C1		
3779 E6	I548 D3		
3780 E7	I549 D2		
3781 E7	I550 D2		
3783 F6	I551 D3		
3784 F7	I552 D4		
3785 F7	I553 D12		
3787 G6	I554 E1		
3788 G7	I555 D12		
3789 G7	I556 D13		
3791 H6	I557 E7		
3792 H7	I558 E7		
3793 H7	I559 E3		
3794 B12	I560 E6		
3795 B12	I561 F2		
3796 A12	I562 F2		
3797 A12	I563 F3		
3798 A12	I564 F4		

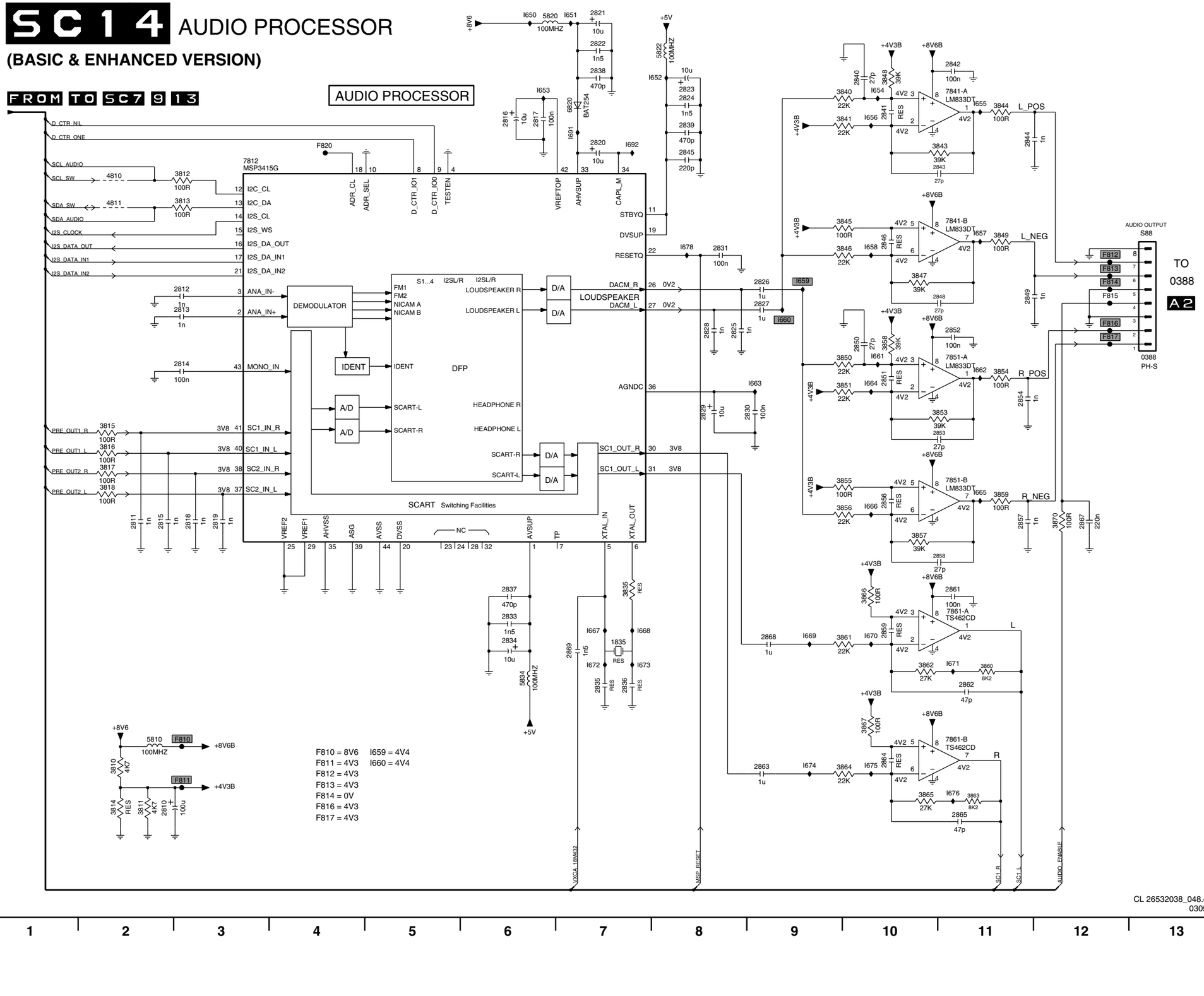
SCAVIO Panel: Audio Processor

SC14 AUDIO PROCESSOR

(BASIC & ENHANCED VERSION)

FROM TO SC7 9 13

AUDIO PROCESSOR



0388 D13 F820 B4
1835 G7 I650 A6
2810 I2 I651 A7
2811 F2 I652 A8
2812 C3 I653 A6
2813 D3 I654 A10
2814 D3 I655 A11
2815 F2 I656 A10
2816 B6 I657 C11
2817 B6 I658 C10
2818 F3 I659 C9
2819 F3 I660 D9
2820 B7 I661 D10
2821 A7 I662 D11
2822 A7 I663 D9
2823 A8 I664 D10
2824 A8 I665 E11
2825 D8 I666 F10
2826 C9 I667 G7
2827 C9 I668 G7
2828 D8 I669 G9
2829 E8 I670 G10
2830 E9 I671 G11
2831 C8 I672 G7
2833 G6 I673 G7
2834 G6 I674 H9
2835 G7 I675 H10
2836 G7 I676 I11
2837 F6 I678 C8
2838 A7 I691 B7
2839 B8 I692 B7
2840 A10
2841 A10
2842 A11
2843 B11
2844 B11
2845 B8
2846 C10
2848 C11
2849 C11
2850 D10
2851 D10
2852 D11
2853 E11
2854 D11
2856 F10
2857 F11
2858 F11
2859 G10
2861 F11
2862 G11
2863 H9
2864 H10
2865 I11
2867 F12
2868 G9
2869 G7
3810 H2
3811 I2
3812 B3
3813 B3
3814 I2
3815 E2
3816 E2
3817 E2
3818 E2
3835 F7
3840 A10
3841 B10
3843 B11
3844 A11
3845 C10
3846 C10
3847 C10
3848 A10
3849 C11
3850 D10
3851 D10
3853 E11
3854 D11
3855 E10
3856 F10
3857 F10
3858 D10
3859 E11
3860 G11
3861 G10
3862 G10
3863 I11
3864 H10
3865 I10
3866 F10
3867 H10
3870 F12
4810 B2
4811 B2
5810 H2
5820 A6
5822 A8
5834 G6
6820 A7
7812 B3
7841-A A11
7841-B C11
7851-A D11
7851-B E11
7861-A G11
7861-B H11
F810 H3
F811 H3
F812 C12
F813 C12
F814 C12
F815 C12
F816 D12
F817 D12

SCAVIO Panel: Audio Delay Line

SC15 AUDIO DELAY LINE
(BASIC & ENHANCED VERSION)

2870 C2
2874 F2
2879 H7
2880 B7
2881 E8
2882 E10
3879 H6
3880 G6
4871 G2
4872 G3
4873 G2
4874 G3
4875 G3
4876 G3
4882 E10
4883 E10
4884 F10
4885 F10
4886 F10
4887 F10
4888 F10
4889 F10
4890 G10
4891 G10
4892 G10
4893 G10
4894 G10
4895 G10
4896 G10
4897 H10
5870 A3
7870 B1
7874 E1
7879 G6
7880 B3
7881 E7
7882 E9
F870 A3
F871 G6
F872 G6
F873 H7
F874 G11
F875 F11

+5V — 5870 100MHZ — F870 — +5D

COUNTER
7870 TC74HC590AF
+5D
2870 100n

7880 CY7C199B
RAM
+5D
2880 100n

COUNTER
7874 TC74HC590AF
+5D
2874 100n

F872
1V / div DC
500ns / div

DFF
7881 74HCT573
+5D
2881 100n

DFF
7882 74HCT573
+5D
2882 100n

4871
4872
4873
4874
4875
4876

+5D
3880 470R
F872
7879 BC847BW
F871
3879 47K
2879 27p
I2S_CLOCK

F873
I2S_DATA_OUT

4882 8ms
4883 16ms
4884 24ms
4885 32ms
4886 40ms
4887 48ms
4888 56ms
4889 64ms

DELAY 1 FOR MONITOR CONFIGURATION 24ms

F875
F874
4890
4891
4892
4893
4894
4895
4896
4897

DELAY 2 FOR TV CONFIGURATION 40ms

I2S_DATA_IN2
I2S_DATA_IN1

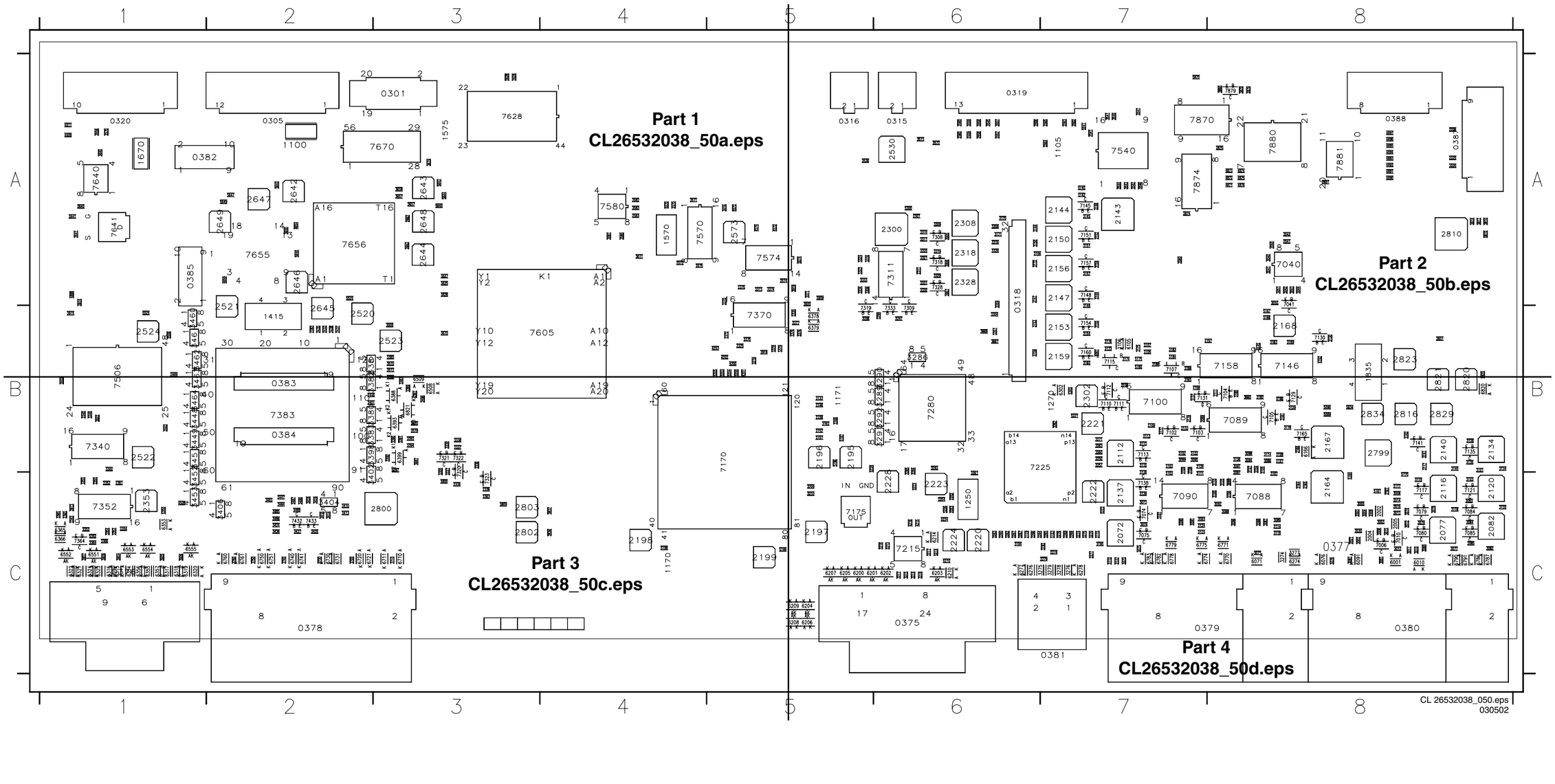
FROM SC14

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030502

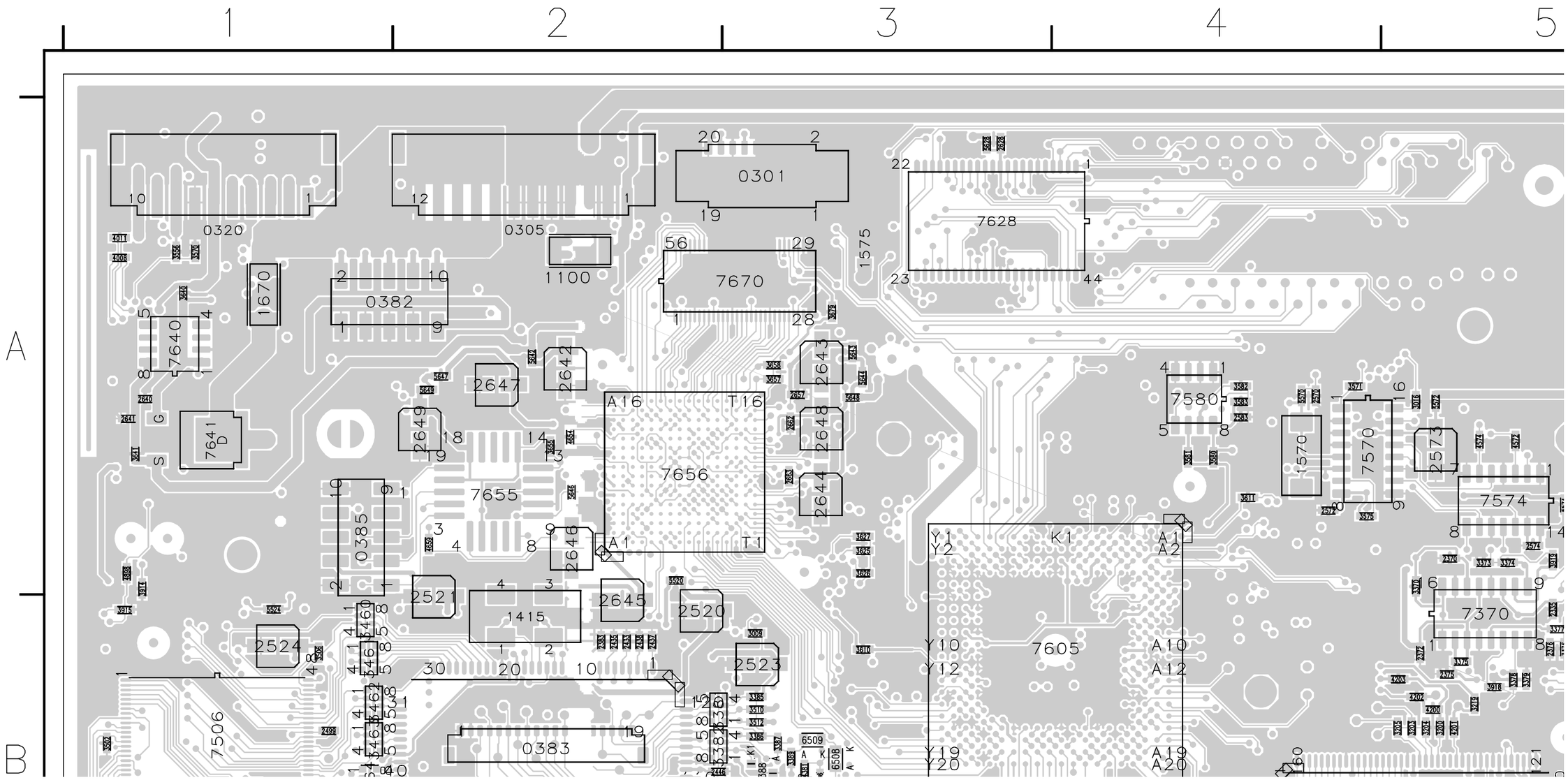
Layout SCAVIO Panel (Overview Top Side)

0301	A3	2005	C8	2120	C8	2217	C6	2311	A6	2541	A7	2810	A8	3051	A8	3103	B7	3137	C7	3174	B7	3260	B7	3321	A6	3379	B5	3452	C1
0305	A2	2008	C8	2123	C7	2220	C6	2318	A6	2557	A6	2816	B8	3071	C8	3104	B8	3138	C7	3175	B7	3261	C6	3323	A5	3380	B2	3453	C1
0315	A6	2012	C8	2124	C7	2221	B7	2328	A6	2558	A6	2820	B8	3072	C7	3105	B8	3139	C7	3176	B7	3262	B7	3324	A5	3381	B2	3460	B1
0316	A5	2014	C8	2127	B8	2222	C7	2335	B5	2559	A6	2821	B8	3073	C7	3106	C8	3140	B8	3177	B7	3263	B7	3328	A6	3382	B2	3461	B1
0318	A6	2015	C8	2128	B7	2223	C6	2336	C3	2560	A6	2823	B8	3074	C7	3107	C8	3141	B8	3178	B8	3271	B7	3329	A6	3383	B2	3462	B1
0319	A6	2021	C8	2134	B8	2224	C6	2337	B3	2562	A7	2829	B8	3075	C7	3108	B7	3142	B8	3179	B7	3274	C8	3330	A6	3385	B3	3463	B1
0320	A1	2030	C8	2137	C7	2225	A8	2338	C3	2563	A7	2831	B8	3076	C8	3109	B7	3144	A6	3180	B8	3275	C6	3331	A6	3386	B3	3464	B1
0375	C6	2040	A8	2140	B8	2226	A8	2340	B1	2564	A7	2834	B8	3077	C8	3110	C8	3145	A7	3181	B8	3276	C7	3333	A5	3387	B3	3483	C2
0376	C1	2041	A8	2142	A7	2228	C6	2343	C1	2565	A7	2870	A8	3078	C8	3111	C7	3146	A7	3182	B8	3277	C8	3334	A5	3389	B3	3484	C2
0378	C2	2042	A8	2143	A7	2252	C6	2351	C1	2566	A6	2874	A7	3079	C8	3112	C7	3147	A6	3183	B7	3278	C7	3336	B3	3390	B3	3485	C2
0379	C7	2060	A7	2144	A7	2253	C6	2352	C1	2570	A4	2879	A8	3080	C8	3113	B7	3148	B7	3184	B7	3279	C7	3337	B3	3391	B3	3486	C2
0380	C8	2072	C7	2145	B8	2254	C6	2353	C1	2572	A4	2881	A8	3081	C8	3114	B8	3149	A7	3186	B7	3284	B6	3338	B3	3392	B3	3487	C2
0381	C7	2077	C8	2146	B5	2260	C6	2354	C1	2573	A5	3001	C8	3082	C8	3115	B7	3150	A6	3188	B7	3285	B6	3339	B3	3393	B3	3488	C2
0382	A1	2082	C8	2147	A7	2261	C6	2355	C1	2574	A5	3002	C8	3083	C8	3116	C8	3151	A7	3189	B8	3286	B6	3340	B1	3394	B3	3489	C2
0383	B2	2088	C8	2150	A7	2262	C6	2365	C1	2583	A4	3003	C8	3084	C8	3117	B8	3152	A7	3193	C7	3289	B6	3346	B1	3397	B3	3496	B3
0384	B2	2089	B7	2151	B5	2263	C6	2370	A5	2628	A3	3004	C8	3085	C8	3118	C8	3153	B6	3194	C6	3290	B6	3351	B6	3398	B2	3502	B1
0385	A1	2090	C7	2152	B5	2264	C6	2372	B5	2640	A1	3005	C8	3086	B8	3119	C8	3154	B7	3195	C7	3291	B6	3352	C1	3401	B2	3503	B1
0387	A8	2097	C8	2153	B7	2265	C7	2375	B5	2641	A1	3006	C8	3087	C8	3120	C8	3155	B7	3200	B5	3292	B6	3353	C1	3402	C2	3506	B1
0388	A8	2103	C7	2156	A7	2266	C6	2376	B5	2642	A2	3008	C8	3088	C8	3121	B8	3156	A6	3203	B5	3293	B6	3354	C1	3404	C2	3510	B3
1100	A2	2105	B7	2157	B8	2267	C6	2383	B2	2643	A3	3009	B3	3089	C8	3122	B7	3157	A7	3204	B5	3297	B6	3355	C1	3406	C2	3512	B3
1105	A7	2106	B7	2158	B5	2268	C7	2433	B2	2644	A3	3010	C8	3090	B7	3123	C8	3158	A7	3205	B5	3298	B5	3359	A6	3410	C2	3519	B3
1170	C4	2107	B7	2159	B7	2269	C7	2435	B2	2645	B2	3011	C8	3091	C7	3124	C7	3159	B6	3209	C5	3299	B6	3363	C3	3413	C2	3520	B3
1171	B5	2108	B7	2161	C8	2270	C7	2437	B2	2646	A2	3012	C8	3092	C8	3125	C8	3160	B7	3210	C5	3304	B6	3364	C1	3414	C2	3536	A5
1250	C6	2109	B7	2164	C8	2274	C7	2438	B2	2647	A2	3013	C8	3093	C7	3126	B8	3161	B7	3213	C6	3305	B3	3365	C1	3415	C2	3540	A7
1270	B7	2110	B7	2165	C8	2275	C7	2446	B2	2648	A3	3014	C8	3094	B8	3127	B8	3162	B5	3214	C6	3306	A5	3366	C1	3424	C2	3541	A7
1415	B2	2111	B8	2166	B8	2276	C7	2447	C2	2649	A2	3015	C8	3095	C8	3128	B8	3163	B8	3215	C6	3308	A6	3370	A5	3425	C2	3542	A7
1570	A4	2112	B7	2167	B8	2277	C7	2499	B1	2657	A3	3016	A5	3096	C8	3129	B8	3164	C8	3216	C6	3309	A6	3371	A5	3426	C2	3543	A7
1575	A3	2113	B7	2168	B8	2278	C7	2520	B2	2662	A3	3040	A8	3097	B8	3130	B8	3165	B7	3217	C6	3310	A6	3373	A5	3427	C2	3544	A7
1670	A1	2114	C8	2195	B5	2279	C7	2521	B2	2663	A3	3041	A8	3098	B8	3131	B7	3166	B5	3218	C6	3311	A6	3374	A5	3428	C2	3545	A6
1835	B8	2115	C7	2196	B5	2300	A6	2522	B1	2799	B8	3042	A8	3099	B7	3133	B5	3219	B5	3316	A5	3375	B5	3429	C2	3546	A7		
2002	C8	2116	C8	2197	C5	2301	A6	2523	B3	2800	C3	3043	A8	3100	C8	3134	B8	3220	A8	3318	A6	3376	B5	3448	B1	3547	A7		
2003	C8	2117	C8	2198	C4	2302	B7	2524	B1	2802	C3	3044	A8	3101	C7	3135	B8	3172	A6	3250	B7	3319	A6	3377	B5	3449	B1	3556	A1
2004	C8	2119	C6	2199	C5	2308	A6	2530	A6	2803	C3	3050	A8	3102	B7	3136	B8	3173	B7	3251	B7	3320	A6	3378	B5	3451	B1	3557	A6

3452	C1	3558	A6	3809	C3	4203	B5	5180	B7	5834	B8	6322	C1	6761	C2	7107	B7	7320	B3										
3453	C1	3559	A6	3810	A8	4215	C6	5196	B5	5870	A7	6323	C1	6770	C8	7110	B7	7321	B3										
3460	B1	3560	A6	3811	A8	4216	C6	5197	B5	6001	C8	6324	C1	6771	C8	7111	B7	7322	B3										
3461	B1	3570	A1	3814	A8	4381	B3	5198	C4	6010	C8	6353	C1	6774	C7	7112	B7	7323	C3										
3462	B1	3571	A4	3836	C4	4500	C1	5199	C5	6071	C8	6354	C1	6775	C7	7113	B7	7328	A6										
3463	B1	3572	A6	3837	C4	4572	A5	5210	C6	6076	C8	6355	C1	6778	C7	7115	B7	7333	B6										
3464	B1	3573	A6	3879	A8	4574	A5	5214	C6	6091	C8	6356	C1	6779	C7	7117	C8	7340	B1										
3483	C2	3575	A4	3880	A8	4654	A2	5221	B7	6105	B7	6357	C1	6782	C7	7121	C8	7352	C1										
3484	C2	3580	A4	3900	C3	4659	A2	5222	C7	6166	B8	6365	C1	6783	C7	7129	B8	7364	C1										
3485	C2	3581	A4	3905	A6	4871	A8	5223	C6	6200	C5	6366	C1	6786	C8	7130	B8	7370	B5										
3486	C2	3582	A4	3906	A6	4872	A8	5224	C6	6201	C5	6378	B5	6787	C8	7131	B7	7383	B2										
3487	C2	3583	A4	3907	A6	4873	A8	5226	C6	6202	C6	6379	B5	6790	C8	7135	B8	7432	C2										
3488	C2	3610	B3	3909	A5	4874	A8	5228	B5	6203	C6	6388	B3	6791	C8	7138	C7	7433	C2										
3489	C2	3611	A4	3913	C1	4875	A8	5300	A6	6204	C5	6393	B3	6820	B8	7141	B8	7506	B1										
3496	B3	3625	A3	3914	A1	4876	A8	5302	B7	6205	C5	6399	B3	6821	B3	7145	A7	7540	A7										
3502	B1	3626	A3	3915	B1	4890	A8	5350	C1	6206	C5	6508	B3	7006	C8	7146	B8	7570	A4										
3503	B1	3627	A3	3918	B5	4891	A8	5352	C1	6207	C5	6509	B3	7010	C8	7148	A7	7574	A5										
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3519	B3	3657	A3	3924	C1	4895	A8	5570	A4	6214	C6	6554	C1	7075	C7	7158	B8	7640	A1										
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3540	A7	3667	B6	3927	C1	4898	A1	5628	A3	6277	C6	6711	C3	7084	C8	7170	B5	7656	A2										
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3542	A7	3679	A3	4008	A1	5090	B8	5643	A3	6302	B7	6721	C2	7088	C8	7215	C6	7870	A7										
3543	A7	3687	B3	4011	A1	5140	A7	5644	A3	6315	C1	6730	C2	7089	B8	7225	B6	7874	A7										
3544	A7	3710	C3	4146	B8	5161	C8	5646	A2	6316	C1	6731	C2	7090	C7	7280	B6	7879	A8										
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3546	A7	3730	C2	4158	B7	5166	B8	5648	A3	6318	C1	6741	C2	7102	B7	7309	B6	7881	A8										
3547	A7	3740	C2	4200	B5	5167	B8	5649	A2	6319	C1	6750	C2	7103	B7	7311	A6												
3556	A1	3750	C2	4201	B5	5170	C8	5810	A8	6320	C1	6751	C2	7104	B8	7318	A6												
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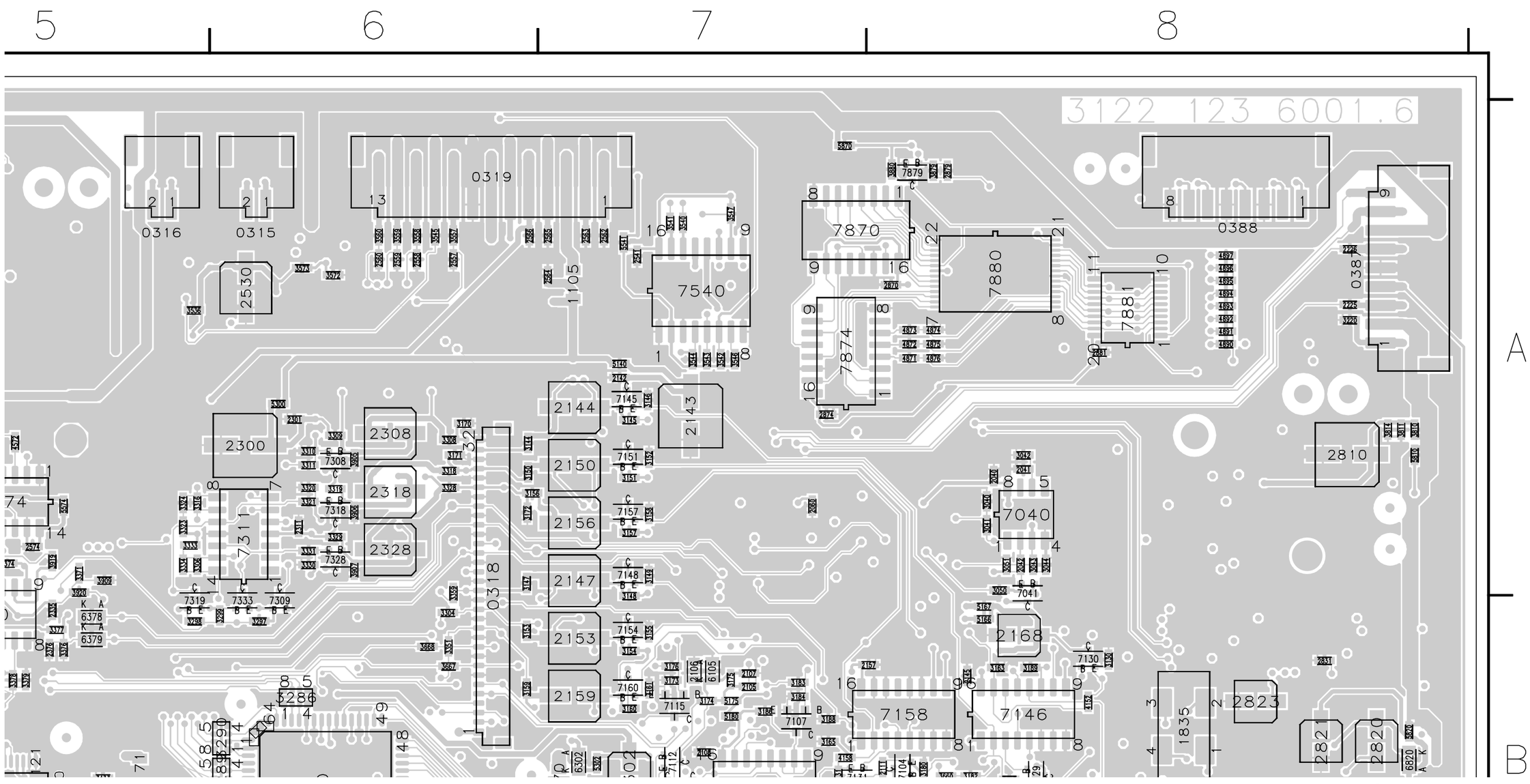


Layout SCAVIO Panel (Part 1 Top Side)



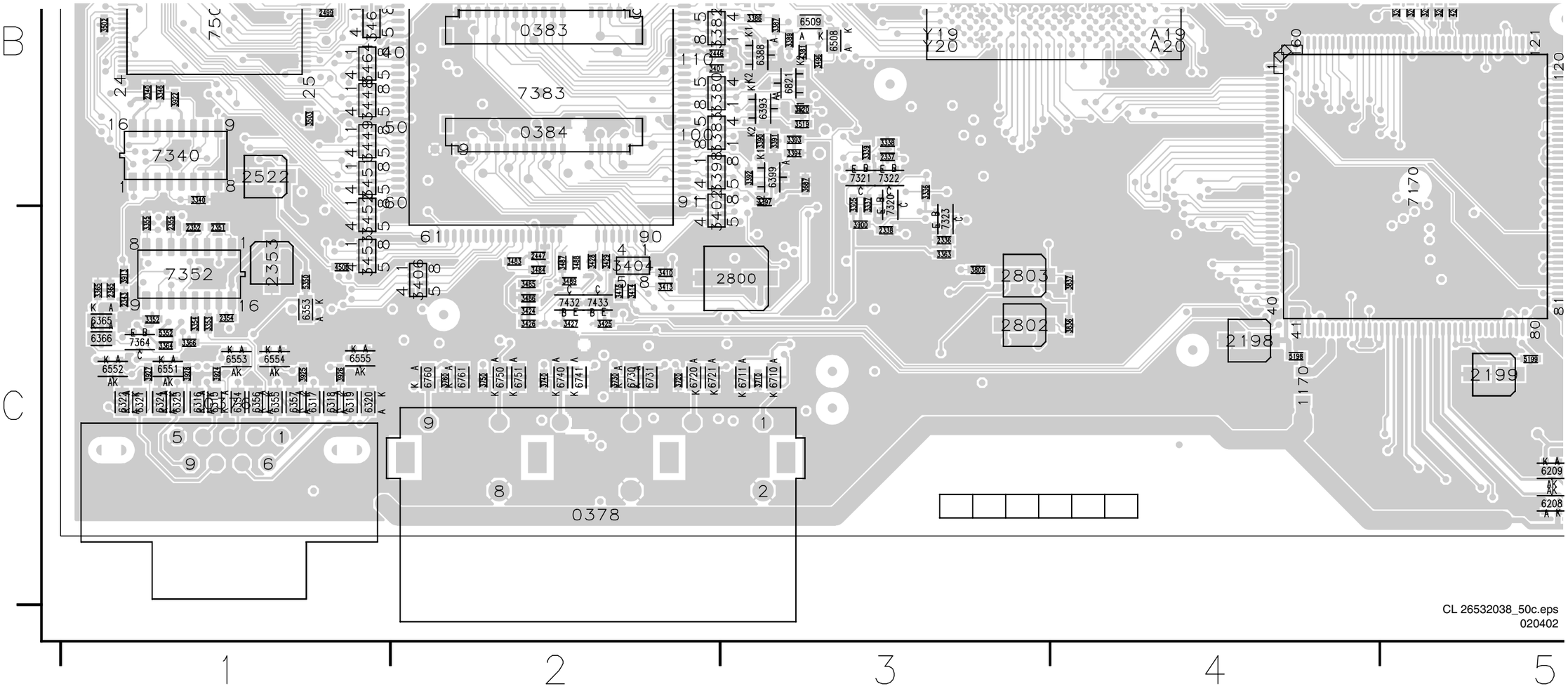
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Layout SCAVIO Panel (Part 2 Top Side)

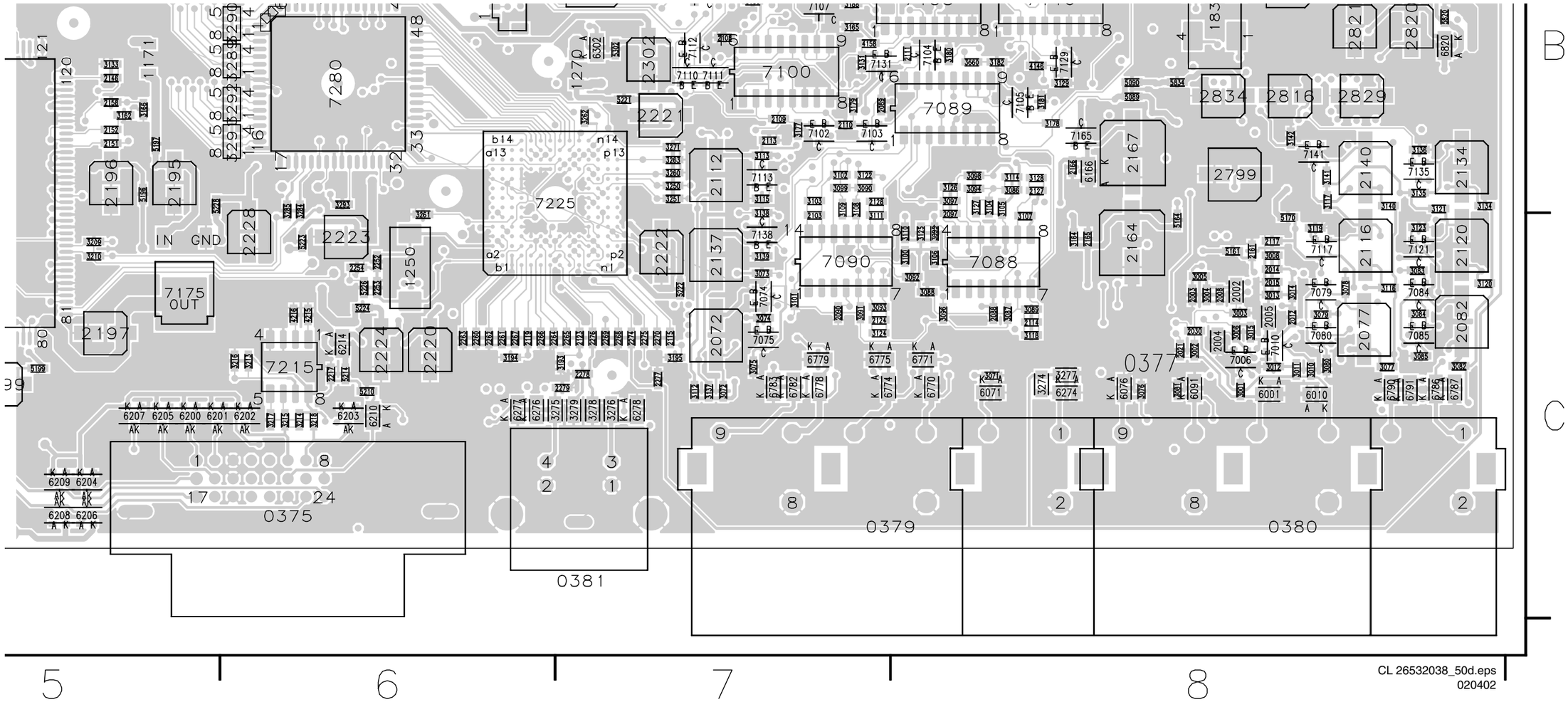


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Layout SCAVIO Panel (Part 3 Top Side)

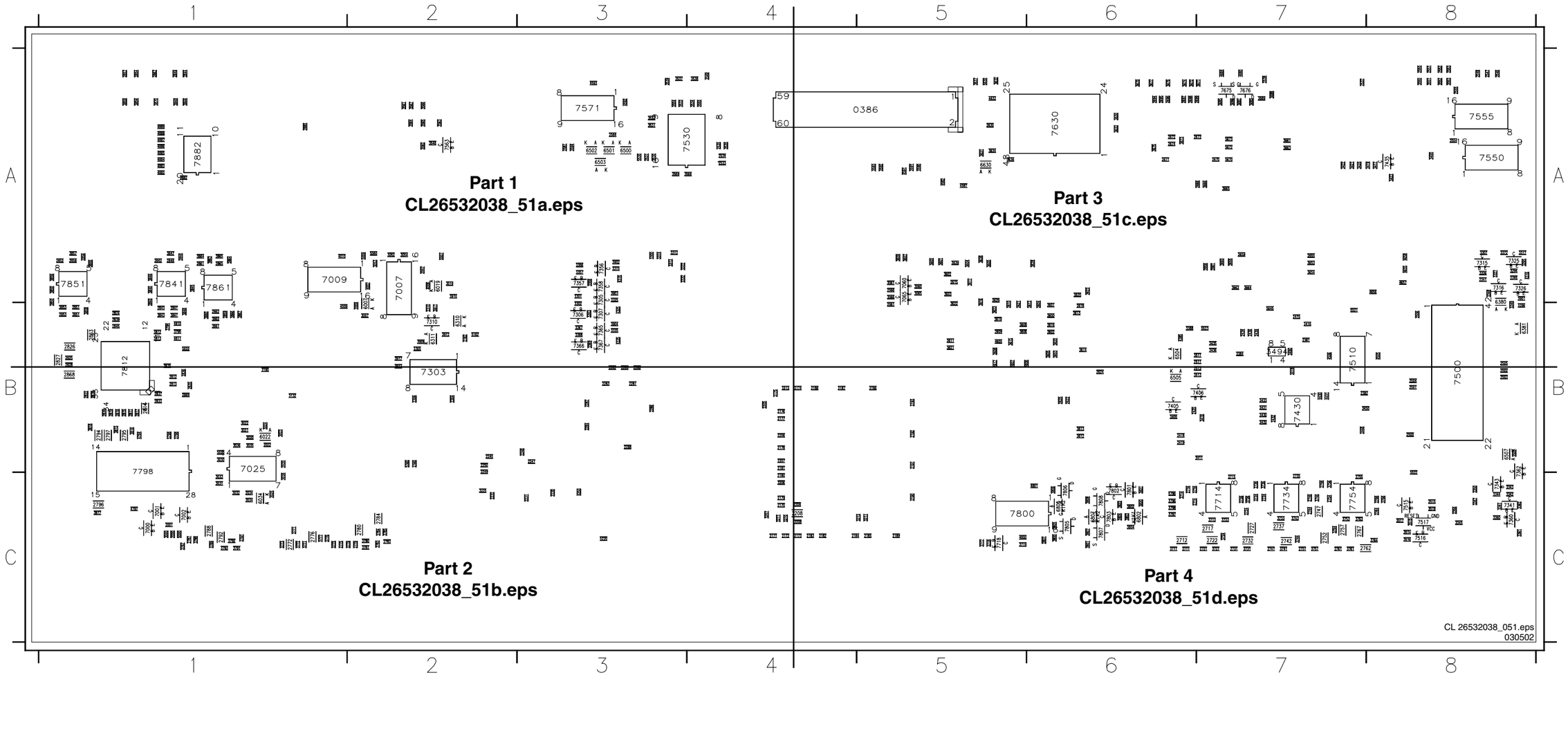


Layout SCAVIO Panel (Part 4 Top Side)

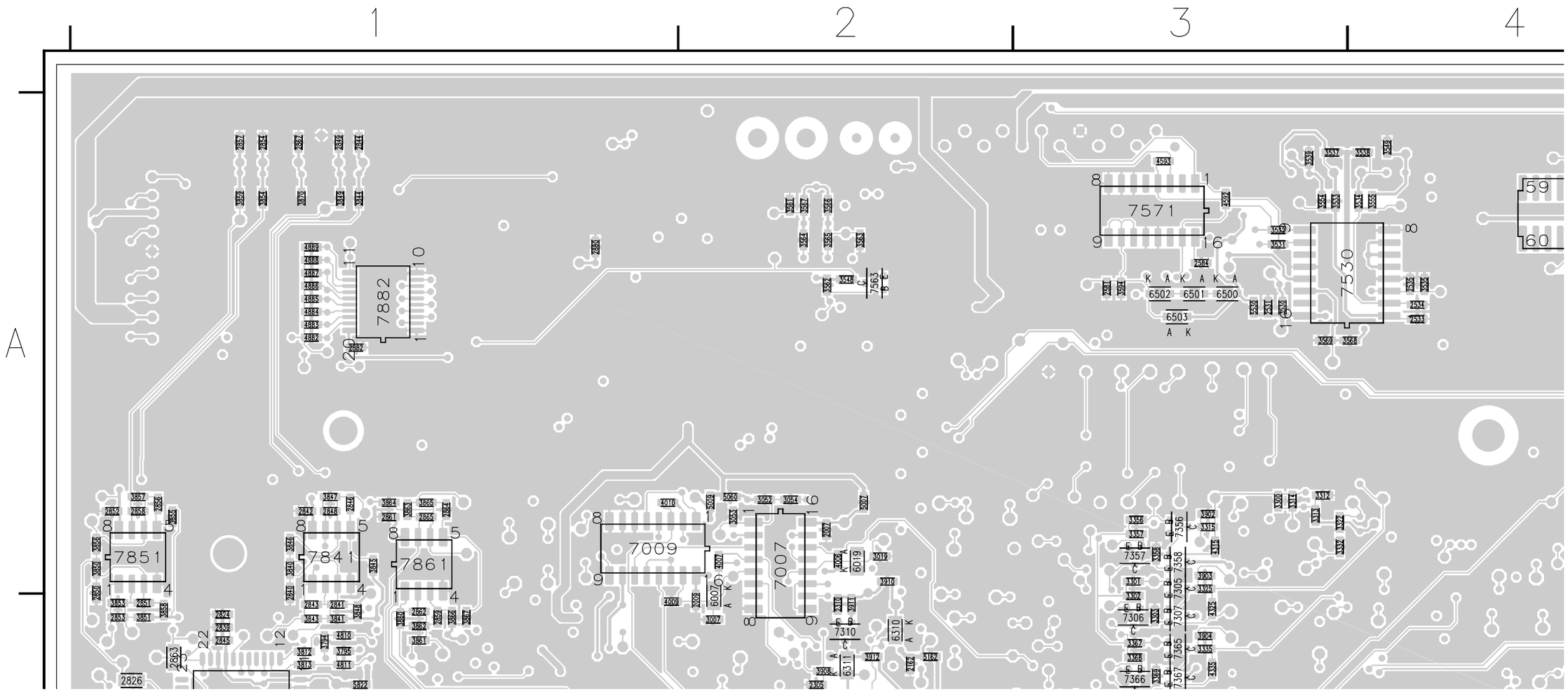


Layout SCAVIO Panel (Overview Bottom Side)

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2009 B2
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2162 B2
2170 C4
2171 C4
2172 C4
2173 C4
2174 B4
2175 B4
2176 B4
2177 B4
2178 B4
2179 C4
2180 C4
2181 B4
2182 C4
2183 C4
2184 C4
2185 C5
2186 B5
2187 B4
2188 B4
2189 C5
2190 C5
2191 B5
2192 B5
2193 B5
2205 B4
2206 B4
2207 B4
2208 C4
2209 C4
2210 C4
2211 C4
2212 B4
2230 C3
2231 C3
2232 C2
2240 B2
2247 B3
2248 B3
2249 B2
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2283 B3
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2286 B3
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2288 B3
2304 B2
2305 B2
2306 B2
2310 B2
2341 A8
2345 A8
2356 C8
2381 B7
2382 B7
2415 B7
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2418 B6
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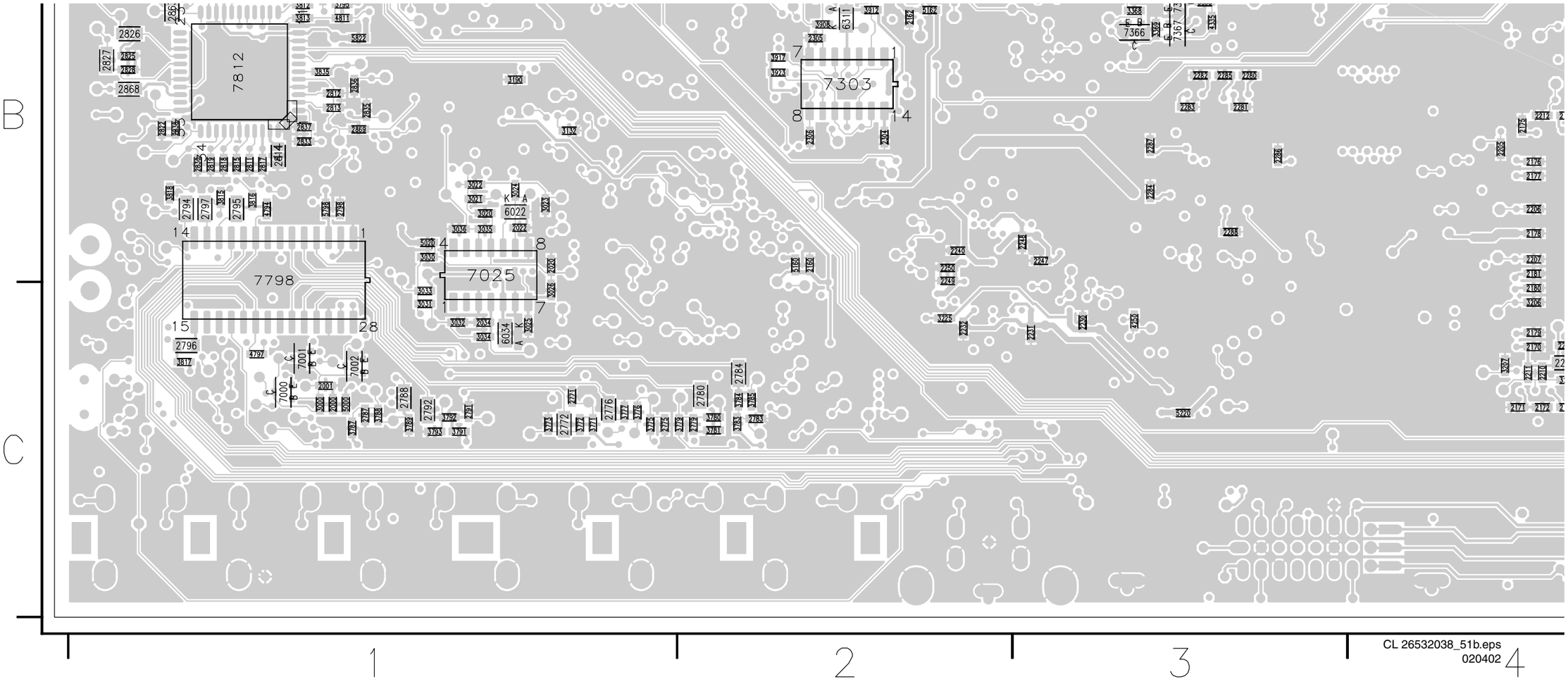


Layout SCAVIO Panel (Part 1 Bottom Side)



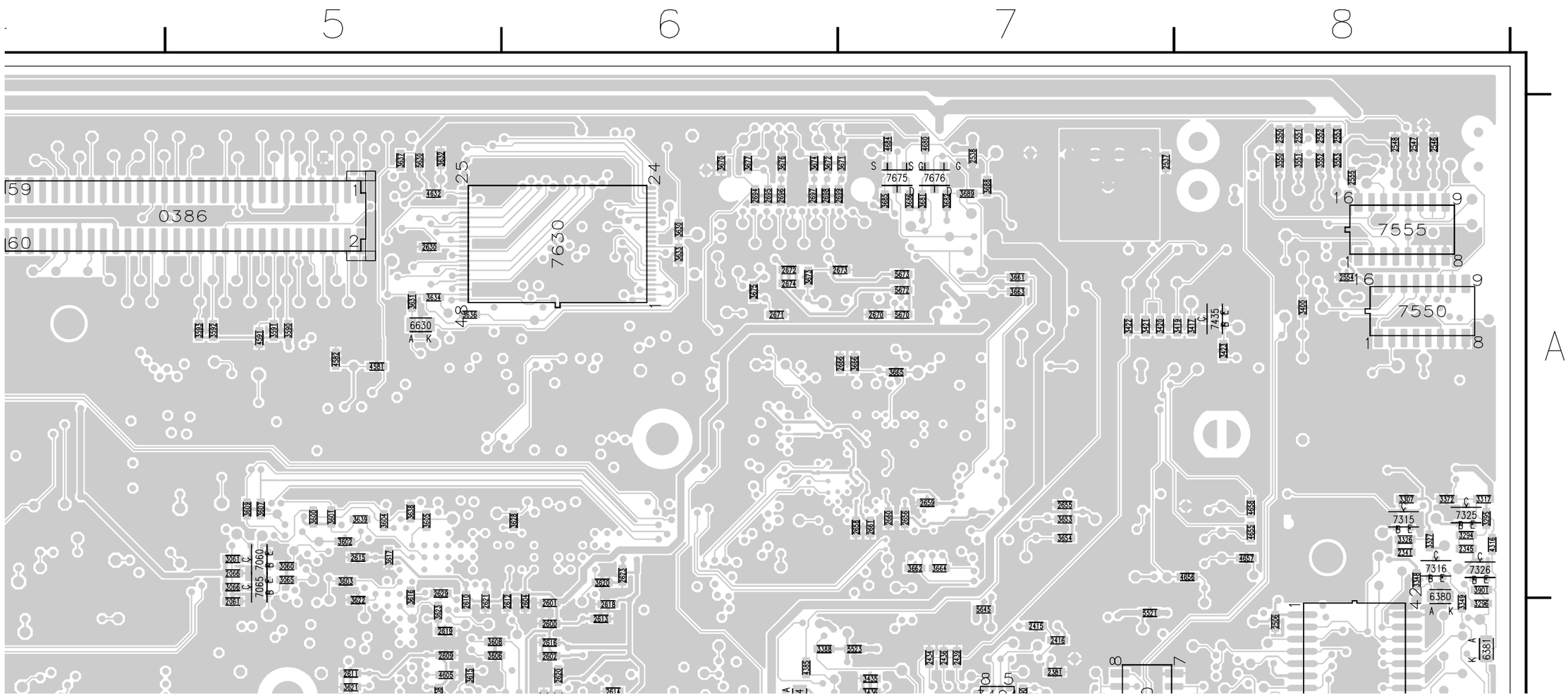
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Layout SCAVIO Panel (Part 2 Bottom Side)



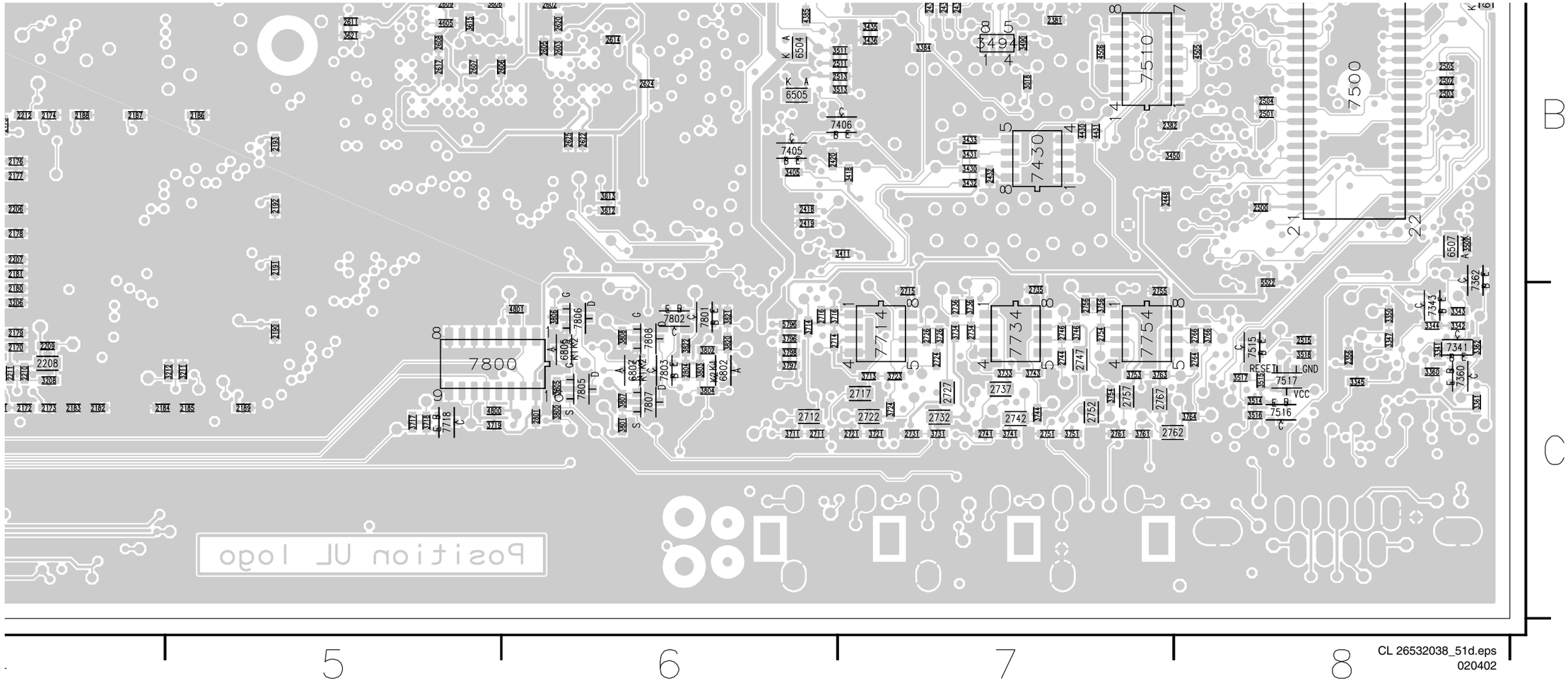
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Layout SCAVIO Panel (Part 3 Bottom Side)



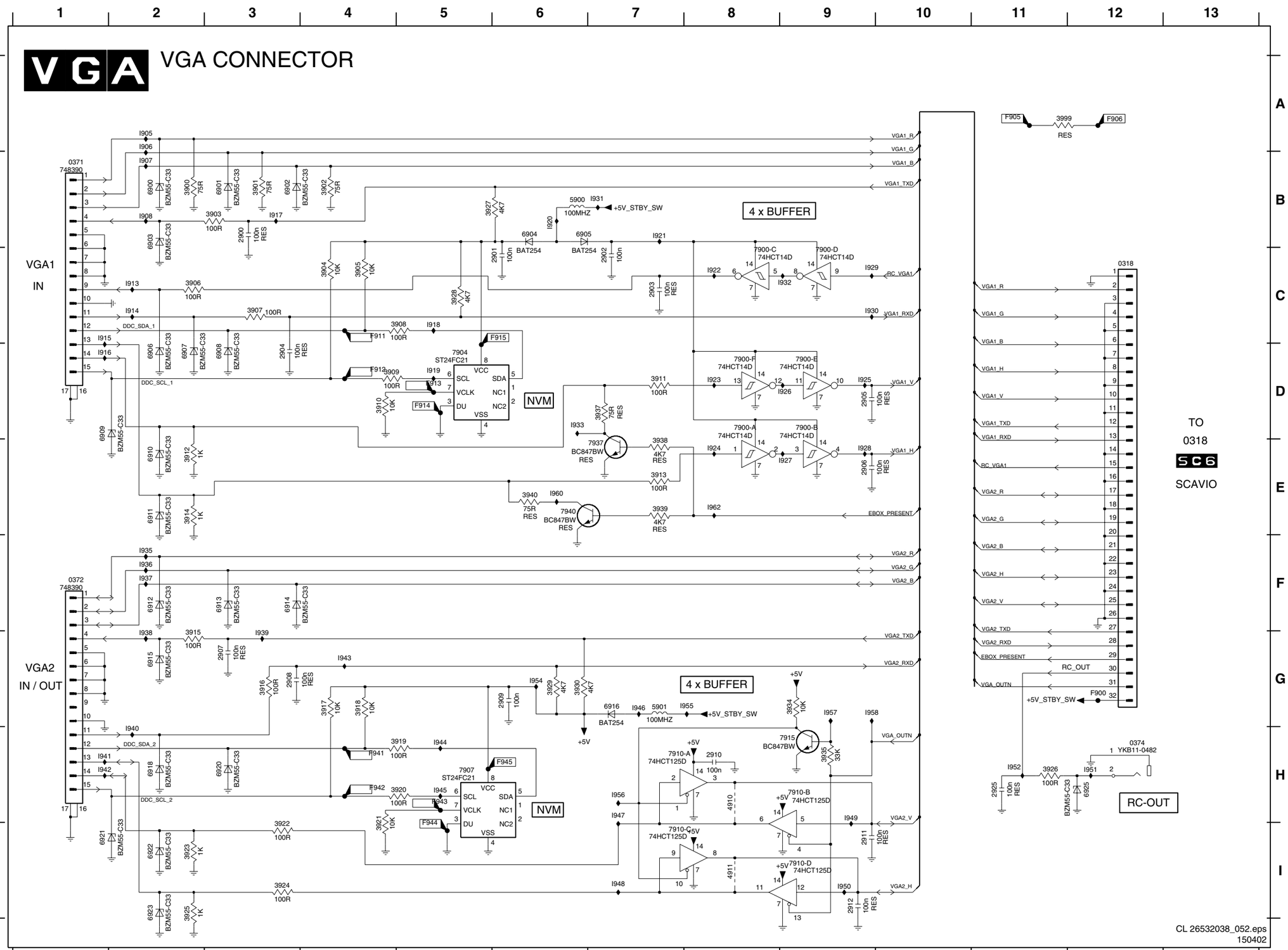
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Layout SCAVIO Panel (Part 4 Bottom Side)



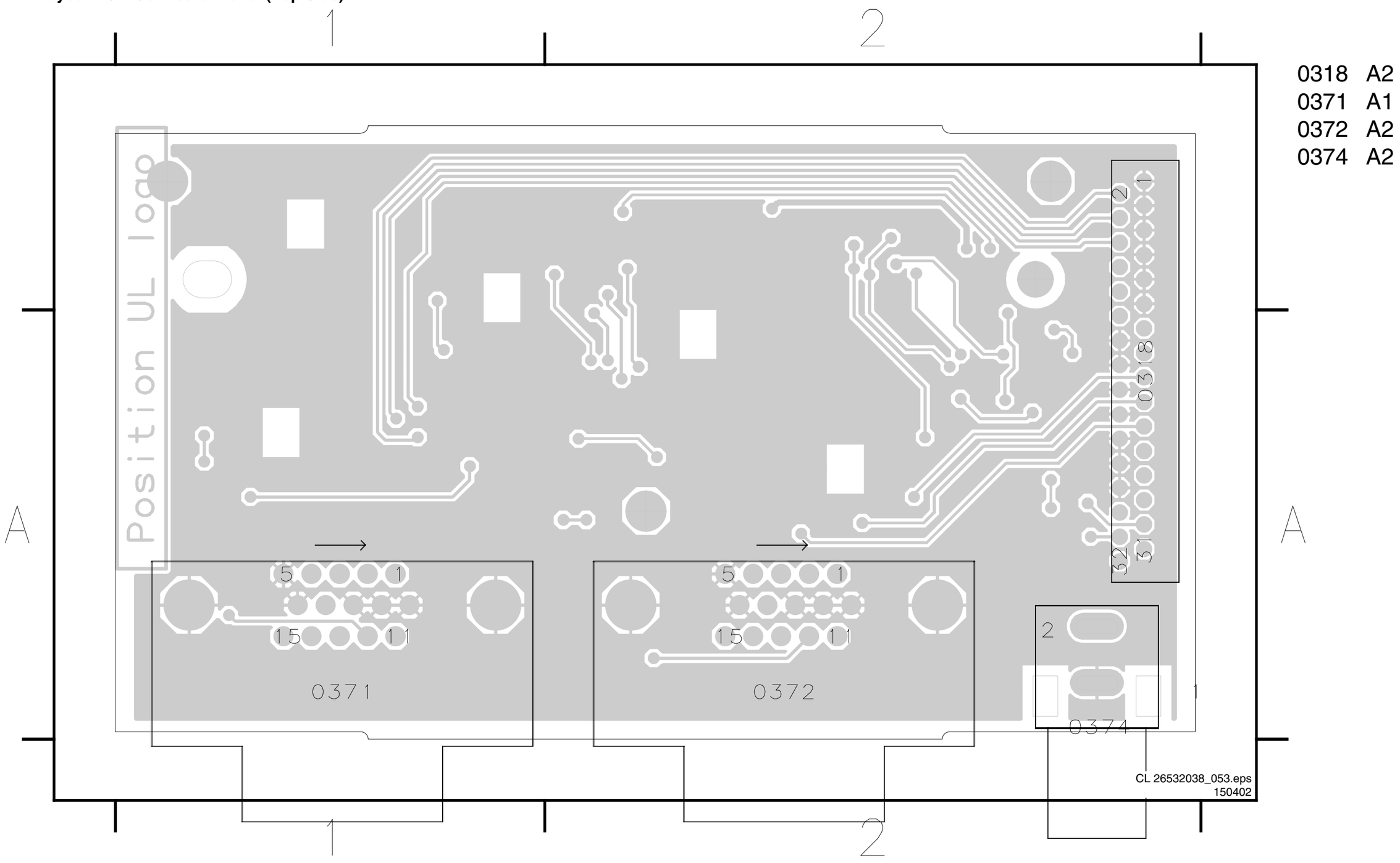
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VGA Connector Panel

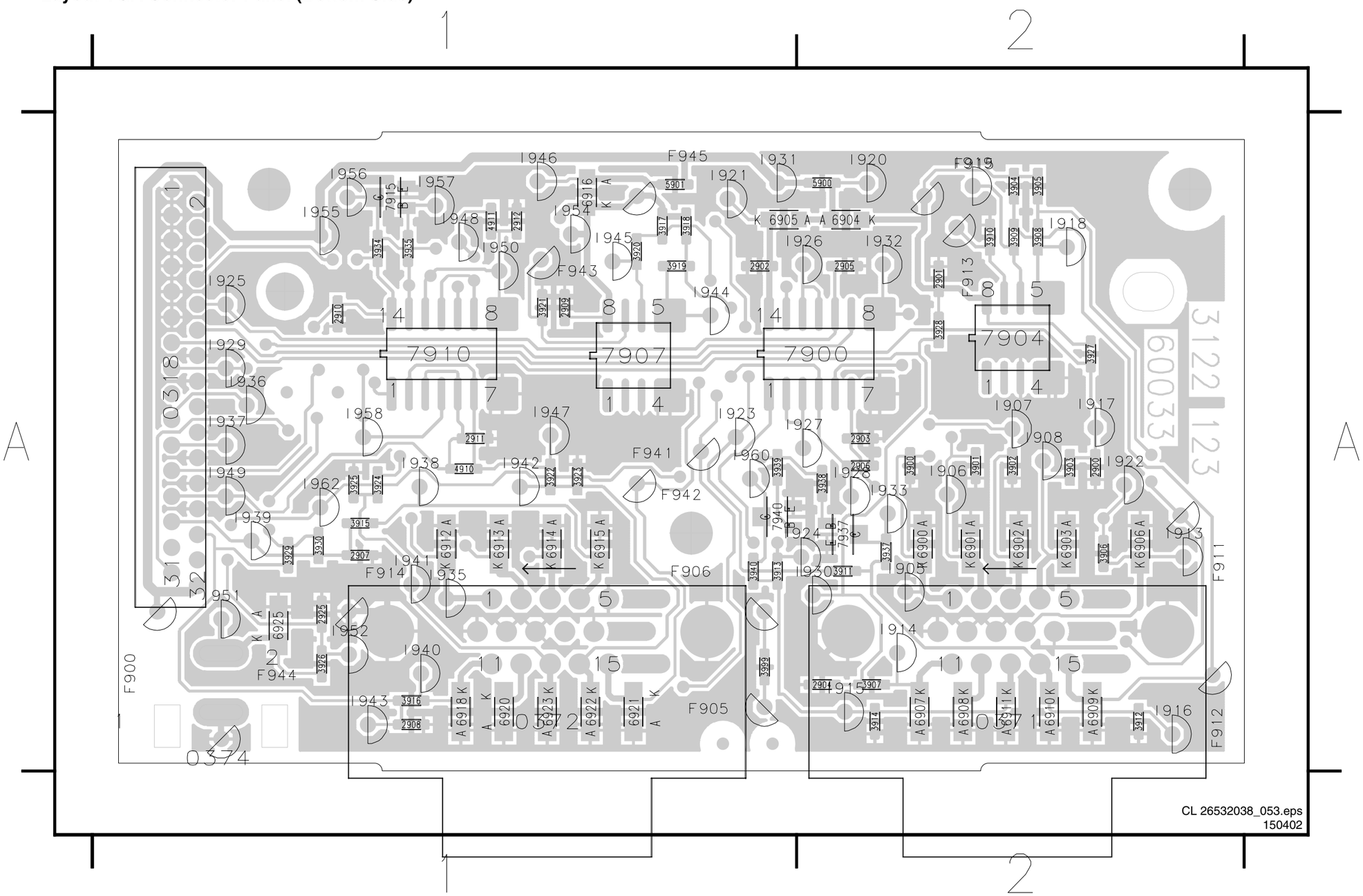


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0374 H13
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2902 C7
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2905 D9
2906 E9
2907 G3
2908 G3
2909 G6
2910 H8
2911 I9
2912 I9
2925 H11
3900 B2
3901 B3
3902 B4
3903 B3
3904 C4
3905 C4
3906 C2
3907 C3
3908 C5
3909 D5
3910 D5
3911 D7
3912 E2
3913 E7
3914 E2
3915 G2
3916 G3
3917 G4
3918 G4
3919 H5
3920 H5
3921 I5
3922 I3
3923 I2
3924 I3
3925 I2
3926 H12
3927 B5
3928 C5
3929 G6
3930 G6
3934 G9
3935 H9
3937 D6
3938 E7
3939 E7
3940 E6
3999 A12
4910 H8
4911 I8
5900 B6
5901 G7
6900 B2
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6904 B6
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6906 D2
6907 D2
6908 D3
6909 D1
6910 E2
6911 E2
6912 F2
6913 F3
6914 F3
6915 G2
6916 G7
6918 H2
6920 H3
6921 I1
6922 I2
6923 I2
6925 H12
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7900-C C8
7900-D C9
7900-E D9
7900-F D8
7904 D5
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7910-A H7
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7910-D I9
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I957 G9
I958 G9
I960 E6
I962 E8

Layout VGA Connector Panel (Top Side)



Layout VGA Connector Panel (Bottom Side)



0318	A1	3930	A1
0371	A2	3934	A1
0372	A1	3935	A1
0374	A1	3937	A2
2900	A2	3938	A2
2901	A2	3939	A1
2902	A1	3940	A1
2903	A2	3999	A1
2904	A2	4910	A1
2905	A2	4911	A1
2906	A2	5900	A2
2907	A1	5901	A1
2908	A1	6900	A2
2909	A1	6901	A2
2910	A1	6902	A2
2911	A1	6903	A2
2912	A1	6904	A2
2925	A1	6905	A1
3900	A2	6906	A2
3901	A2	6907	A2
3902	A2	6908	A2
3903	A2	6909	A2
3904	A2	6910	A2
3905	A2	6911	A2
3906	A2	6912	A1
3907	A2	6913	A1
3908	A2	6914	A1
3909	A2	6915	A1
3910	A2	6916	A1
3911	A2	6918	A1
3912	A2	6920	A1
3913	A1	6921	A1
3914	A2	6922	A1
3915	A1	6923	A1
3916	A1	6925	A1
3917	A1	7900	A2
3918	A1	7904	A2
3919	A1	7907	A1
3920	A1	7910	A1
3921	A1	7915	A1
3922	A1	7937	A2
3923	A1	7940	A1
3924	A1		
3925	A1		
3926	A1		
3927	A2		
3928	A2		
3929	A1		

8. Alignments

Index of this chapter:
1. General Alignment Conditions
2. Hardware Alignments
3. Software Alignments and Settings

Note: The Service Default Mode (SDM) and Service Alignment Mode (SAM) are described in chapter 5. Menu navigation is done with the 'CURSOR UP, DOWN, LEFT or RIGHT' keys of the remote control transmitter.

8.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:
- Mains voltage and frequency: 220 V_{AC} / 50 Hz unless otherwise stated.
- Connect the set to the Mains via an isolation transformer.
- Allow the set to warm up for approximately 20 minutes.
- Measure the voltages and waveforms in relation to chassis ground (with the exception of the voltages on the primary side of the power supply). Never use the cooling fins/plates as ground.
- Test probe: Ri > 10 MΩ, Ci < 2.5 pF.
- Use an isolated trimmer/screwdriver to perform the alignments.

Use a VGA-generator or a Personal Computer (contact your National Service Organisation for the necessary test pattern files) as test pattern generator and connect it to the VGA1 input of the FM24 plasma monitor. When you use a PC, start Microsoft PowerPoint (or Paintbrush), and load the mentioned file. Then display the picture as full screen.

8.2 Hardware Alignments

There are no hardware alignments necessary. The VS/VA alignments are set in the factory and do not need additional adjustment.

8.3 Software Alignments

Enter the Service Alignment Mode (see chapter 5). The SAM menu will now appear on the screen.
Select one of the following alignment menus via the upper horizontal bar:
1. General (Gen.)
2. Display (Disp.)
3. Scaler (Scal.)
4. Video 1 (Vid.1)
5. Video 2 (Vid.2)
6. Options (Opt.)

Note: the last three items are not available in the *Basic* configuration.

8.3.1 General

Table 8-1 SAM Menu 'Gen.'

Service Alignment Menu	General
Type nr. - AG Code	32FD9944/01S (example)
SW version OTC	AAAABC-X.Y xxxxx
SW version PW	AAAABC-X.Y xxxxx
SW version EPLD	AAAABC-X.Y xxxxx
Errors 1	xx xx xx xx xx
Errors 2	xx xx xx xx xx
Operational hours	xx
Reset error buffer	Press OK to reset
Store	Press OK to store

Store
Select this item, and press OK, to store the made alignments.

Note: There are several methods to exit the SAM, each with its own characteristics:
- Switch the set 'off' (with the Mains switch or by pulling the Mains cord); new alignment settings are **always** stored, even when item 'store' was not activated!
- Switch the set to 'standby' by pressing the power button on the remote control transmitter; new alignment settings are **always** stored, even when item 'store' was not activated!
- Use a standard RC-transmitter and key in the code **0 0**; new alignment settings are **not** stored (except when item 'store' was activated)!

8.3.2 Display

Table 8-2 SAM Menu 'Disp.'

Service Alignment Menu	Display
Test pattern	On / Off
Contrast	Adjust **...**
Gamma	Adjust **...**
White point	Adjust **...**
Compensation fact.	0 <-------\|-------> 255
	128

Test pattern
Possible to generate an 'even white' test pattern, which is generated by the PDP. You can use this picture, to check the plasma display for pixel defects.

Contrast
Not necessary to align, fixed value is 255.

Gamma
Not necessary to align, fixed value is 2.

White point
Not necessary to align, unless stated by the NSO. Fixed value is 255.

Compensation factor
Not necessary to change. Fixed value is 128. In some cases however, a new software table must be loaded in the PW Scaler (via ComPair). The following service scenarios are possible:
- **When a defective glass filter plate is replaced:**
 This requires a new 'White Point' adjustment (see next paragraph).

- **When a defective PDP is replaced by the same type:**
 This requires a new 'White Point' adjustment (see next paragraph).
- **When a defective PDP is replaced by another (newer) type:**
 This requires both a new compensation table upload (by ComPair), and a new 'White Point' adjustment (see next paragraph).
 Note: The loaded software, performs the settings automatically.

8.3.3 Scaler

Table 8-3 SAM Menu 'Scal.'

Service Alignment Menu	Scaler
Test pattern	On / Off
Color temperature	6500K / 7600K / 10000K
White point	Adjust **...**
Align ADC	Press OK to execute

Test pattern
This function makes it possible to generate a 'colour bar' test pattern (generated by the PW Scaler IC). You can use this picture, to check the video path, starting at the PW Scaler IC to the plasma display.

Colour temperature
Select the appropriate colour temperature for the alignments (see also 'White point' adjustment below).

White Point

Table 8-4 SAM Menu 'Scaler - White Point'

Service Alignment Menu	Scaler - White point
White point red	<----------\|----------> 125
White point green	<---------\|----------> 100
White point blue	<----------\|----------> 110
Press OK when done	

Method 1 (with colour analyser)
1. Supply, via an external VGA source (e.g. a PC with 1024x768 mode, or a VGA generator), a '**White Drive**' test pattern (ask your NSO). This picture consists of black picture with in the middle a 100% white square.
2. Set BRIGHTNESS to '53' and CONTRAST to '65' (via the standard customer menu).
3. Go to the SAM menu.
4. Set COLOR TEMPERATURE to '7600 K'.
5. Measure with a CTV colour analyser (calibrated with the spectra) on the centre of the white square on the screen.
6. Select 'White point' in the SAM Scaler menu, and press CURSOR RIGHT.
7. Adjust with the CURSOR UP/DOWN or LEFT/RIGHT command, the three white points Red, Green and Blue to '128' (do **not** go above this value!), and align with one or two of the drivers to the correct coordinates (see table).
8. Repeat the same measurement for respectively colour temperature '6500 K' and '10000 K'.
9. Repeat again if necessary.

Table 8-5 White Point XY-coordinates

Colour Temperature	x	y
5600 K (Cool)	313	329
7600 K (Normal)	299	309
10000 K (Warm)	280	289

Method 2 (without colour analyser)
Without a CTV colour analyser, it is possible to set some parameters, which are based on average values from production.

Table 8-6 White point RGB-values

Colour Temperature	R	G	B
5600 K (Cool)	120	119	128
7600 K (Normal)	128	121	121
10000 K (Warm)	128	120	110

Align ADC
1. Supply, via an external VGA source (e.g. a PC, mode 1024x768), the '**ADC alignment**' test pattern (ask your NSO). This picture consists of a half black and half white picture: black is 16, and white is 235 on a full scale of 255 (=770 mV).
2. Go to the SAM menu.
3. Select 'Align ADC' in the SAM Scaler menu, and press CURSOR RIGHT.
4. The alignment is performed automatically.

8.3.4 Video 1 (Enhanced version only)

Table 8-7 SAM Menu 'Vid. 1'

Service Alignment Menu	Video 1
Test pattern	On / Off
Brightness	0 <----------\|---------- > 255
Contrast	0 <----------\|---------- > 255
Sharpness	0 <----------\|---------- > 255

Test pattern
This function makes it possible to generate a 'full white' test pattern (generated by the de-interlacer SDA9400, item 7280). You can use this picture, to check the video path of the external inputs AV1, 2 and 3, starting at item 7280 (the proper functioning of the Digital Video Decoder SAA7118 is not tested!).
Note: To generate the test pattern, it is necessary to feed a signal to one of the AV-inputs.

Brightness
This is the setting of IC7225 (SAA7118). Not necessary to align, fixed value is:
- PAL/SECAM: 132
- NTSC: 139

Contrast
This is the setting of IC7225 (SAA7118). Not necessary to align, fixed value is:
- PAL/SECAM: 139
- NTSC: 128

Sharpness
Not necessary to align, fixed value is 6.

8.3.5 Video 2 (Enhanced version only)

Table 8-8 SAM Menu 'Vid. 2'

Service Alignment Menu	Video 2
Lum. delay PAL	0 <----------\|---------- > 7
Lum. delay SECAM	0 <----------\|---------- > 7
Lum. delay NTSC	0 <----------\|---------- > 7

With the 'Luminance delays' alignment, you can place the luminance information on the chrominance information (push brightness onto the colour). Use a colour bar/grey scale pattern as test signal.
These values are normally fixed.

Lum. delay PAL
Apply a PAL colour bar/grey scale pattern as a test signal. Adjust value until the transients of the colour part and black and white part of the test pattern are at the same position. Fixed value is 4.

Lum. delay SECAM
Apply a SECAM colour bar/grey scale pattern as a test signal. Adjust value until the transients of the colour part and black and white part of the test pattern are at the same position. Fixed value is 4.

Lum. delay NTSC
Apply a NTSC colour bar/grey scale pattern as a test signal. Adjust value until the transients of the colour and black & white part of the test area are at the same position. Fixed value is 4.

8.3.6 Options (Enhanced version only)

Table 8-9 SAM Menu 'Opt.'

Service Alignment Menu	Options
V_s/V_a control	On / Off
Display size	32" / 42"
Virgin	On / Off
ICONN control	On / Off

Vs/Va control
When this option is set to 'on', it will enable the 'PDP feedback loop' for the **automatic** Vs/Va alignment. See table below for the correct setting.

Table 8-10 Vs/Va Control options

	PSU version 3	PSU v.3 with precision R's	PSU version 4
PDP with Vs feedback(-52 PDP)	Feedback loop 'OFF', alignment is necessary.	Feedback loop 'ON', but alignment (check) is necessary (see par. 8.2 for values) .	Feedback loop 'ON', no alignment necessary.
PDP with Vs/Va feedback(with 'B' in serial number)	Feedback loop 'OFF', alignment is necessary.	Feedback loop 'ON', no alignment (check) necessary.	Feedback loop 'ON', no alignment necessary.

Display size
Fixed value is 32". This option is only meant for the factory, to indicate the display size for the software.

Virgin
Normally 'off'. When this option is set to 'on', the display starts with the language selection menu.

ICONN control
Normally 'off'. Set this option to 'on' in case a so-called 'ICONN'-box (for Hotel TV) is connected to the display.

Caution: When this option is set to 'on', **without an ICONN-Box** connected to the monitor, one cannot control the monitor anymore (because the RC connection is interrupted).

There are two ways to restore the remote control again:
- connect pin 8 (IR_TX) to pin 9 (IR_RX) on the RS232 connector of the monitor (the easiest way to do this, is to make a 'dummy' connector with these pins connected, and plug this into the monitor). or
- Set the set in the Service Alignment Mode (SAM) **via shorting jumpers 1 and 2 of connector 0382** on the SCAVIO panel.
 After this you can enter the appropriate menu to set 'ICONN control' to 'off' again.

9. Circuit Descriptions and List of Abbreviations

Index of this chapter:

1. General
2. Power Supply unit
3. VGA connector panel
4. SCAVIO panel
5. Audio Amplifier panel
6. LED/Switch panel
7. Plasma Display Panel
8. Abbreviations
9. IC Block diagrams

Notes:

- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the diagrams in chapter 6 and 7. Where necessary, you will find a separate drawing for clarification.

9.1 General

The FM24 is the 3rd generation Philips plasma monitors. In comparison to the FTV1.9DE, it has:

- A power supply that is based on the one in the FTV1.9,
- A new SCAVIO panel, which takes over the tasks of the former AVC and LIMESCO panels.
- A new class-D audio amplifier,
- A new, improved 42'' PDP (with new ALiS technology).

It is possible to use this product as stand-alone monitor or, in combination with the so-called F21RE Receiver box, for TV applications.

There are two configurations:

- **Basic:** which has one video input (VGA1) and one video output (VGA2). The VGA2 video output is directly connected to the VGA1 video input, without any processing. The audio output of VGA2 is also directly connected to the VGA1 audio input.
- **Enhanced:** which has six video inputs (VGA1, VGA2, DVI-D, CVBS, YC and HD) and six corresponding audio inputs. These inputs are internally converted to the appropriate signals. The VGA2 connection is here bi-directional (Flex-VGA).

Note: In all descriptions below, the *Enhanced* version of the FM24 is discussed. When there are important differences between the *Basic* and *Enhanced* versions, this is mentioned.

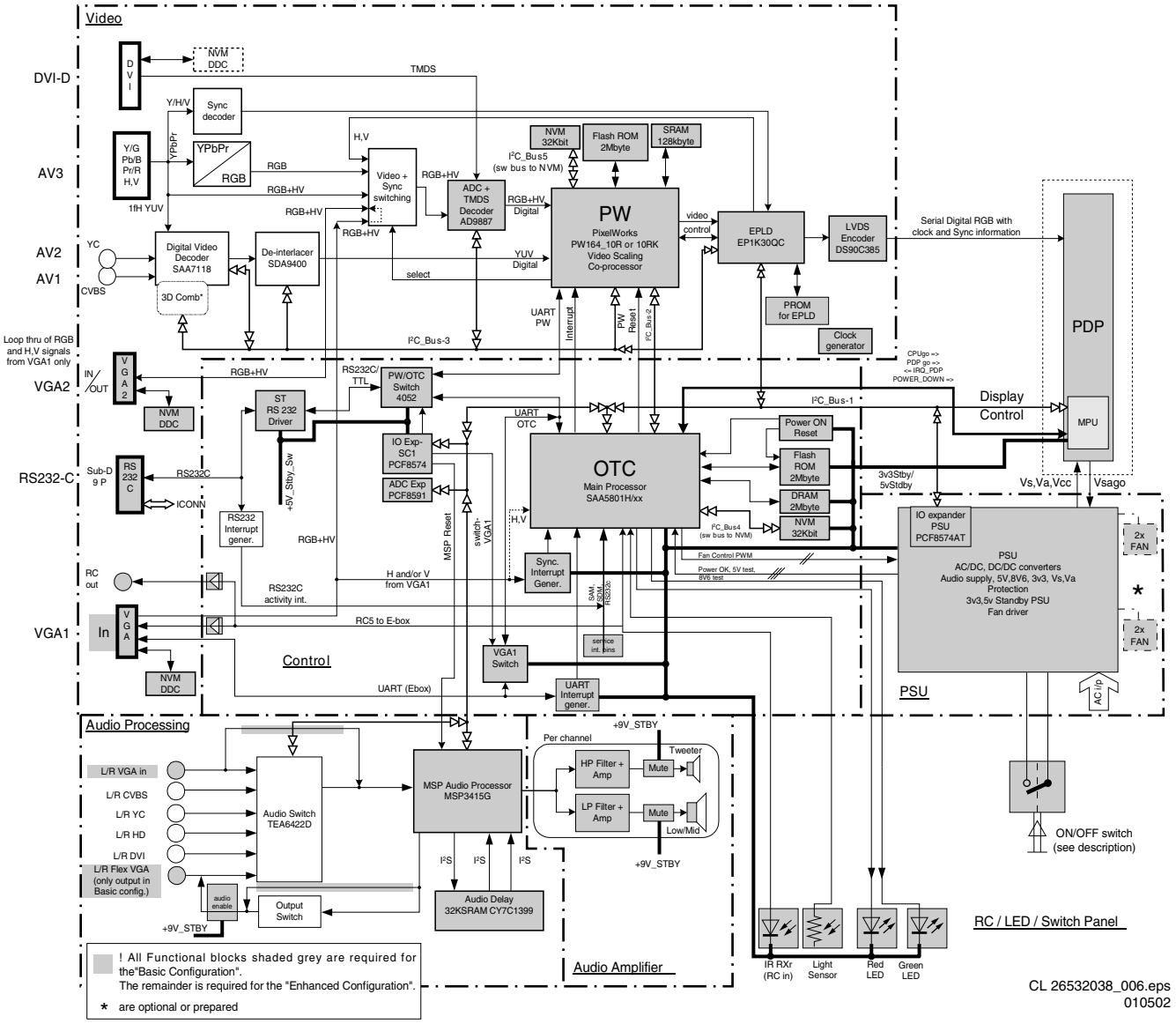


Figure 9-1 Control and Data Path

9.1.1 Input/Output

The main inputs are:

- **Basic:** VGA only,
- **Enhanced:** VGA, Flex-VGA, DVI-D, HD-RGB+HV, HD-2fH-YPbPr (sync on Y), 1fH-YCbCr (sync on Y), YC, CVBS on cinch. Flex-VGA gives the user a choice to configure the 'loop-through VGA output' as an output or as input.

9.1.2 Video

This mainly consists of an analogue processing part and a digital processing part. The video inputs like VGA (*Basic* configuration), CVBS, YC, HD-RGB/YUV (1fH and 2fH) and DVI-D are received and processed.
The VGA signals are first converted to digital signals and then processed by the PW Scaler.

The YPbPr (2fH) signal is discretely converted to RGB, whereas the YCbCr (1fH) signal is processed in the SAA7118 Digital Video decoder.

The base-band video inputs (CVBS and YC) are output from this decoder as digital YUV, which are then further processed by the Pixel Works Scaler (PW).

The signals on the digital DVI input are first decoded by the TMDS decoder inside the AD9887 and then processed by the PW Scaler.

The PW Scaler output is going through an EPLD and then via an LVDS Encoder to the Fujitsu/Hitachi PDP (Plasma Display Panel) as differential serial data. This PDP is based on ALiS (Alternate Lighting of Surface) technology and is an interlaced display, with separate odd and even fields to be displayed.

9.1.3 Audio

This mainly hosts the audio inputs for the various video inputs. They go through an I^2C controlled source selector. The main audio processing is done by the Micronas MSP3415G version with built-in UltraBass-II algorithm.

A digital delay line is created using the I^2S channel and SRAM. The delay created can be selected between two values, one for the Receiver box, and one for the Monitor.

The processed audio signals are then differentially transmitted to the audio amplifier panel. This amplifier drives a tweeter and a twin-drive woofer (low/mid range). Active filtering is done prior to the amplifiers.

9.1.4 Control

The main controller is the OTC, referred to as the 'main processor'. This operates in co-ordination with the processor in the Pixel Works Scaler (PW), referred to as the 'co-processor'.

When the FM24 monitor is connected to an F21RE Receiver box, the UART commands from the Receiver box will control the monitor.

In stand-alone mode, the monitor can be controlled via the Remote Control or via the RS232C port.

DDC1/2B (Digital Data Channel, an I^2C-based protocol) is implemented with separate identification NVMs for the two VGA inputs and the DVI-D input as well. In addition, the RS232C port can be used for software download to the PW and the OTC. The target for downloading is controlled via a switch in the RS232C path; the switch itself is controlled by the OTC.

9.1.5 Power Supply

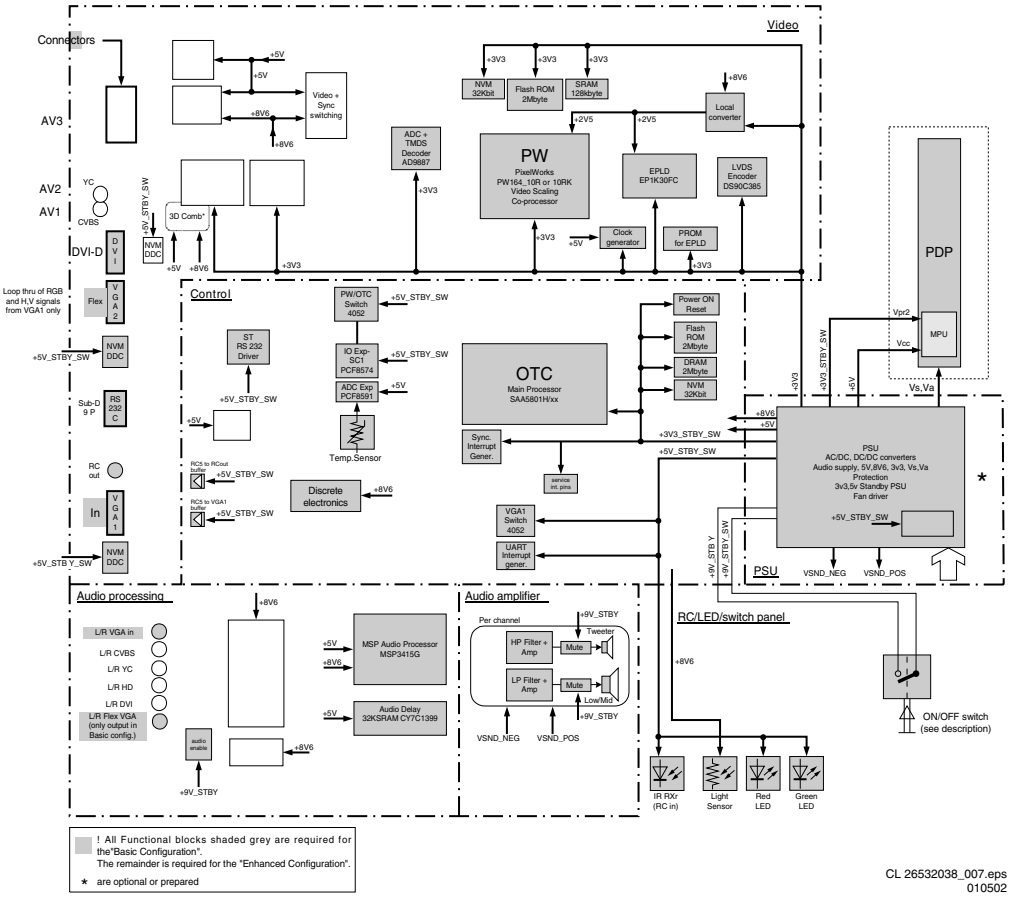


Figure 9-2 Power Supply Path

The PSU consists of a pre-conditioner part and a DC/DC converter part. This converter supplies power to the PDP high voltages, the auxiliary voltages, and the audio amplifier. There is a separate standby power supply, which supplies the Main Processor, PDP microcontroller, interrupt generator and some other circuits.

The mains inlet module will host the inlet and filtering.

There is a functional 'Mains on/off' switch on the LED panel. This switch is on the secondary side, controlling the relays on the primary side.

9.2 Power Supply Unit (Diagrams P)

9.2.1 Introduction

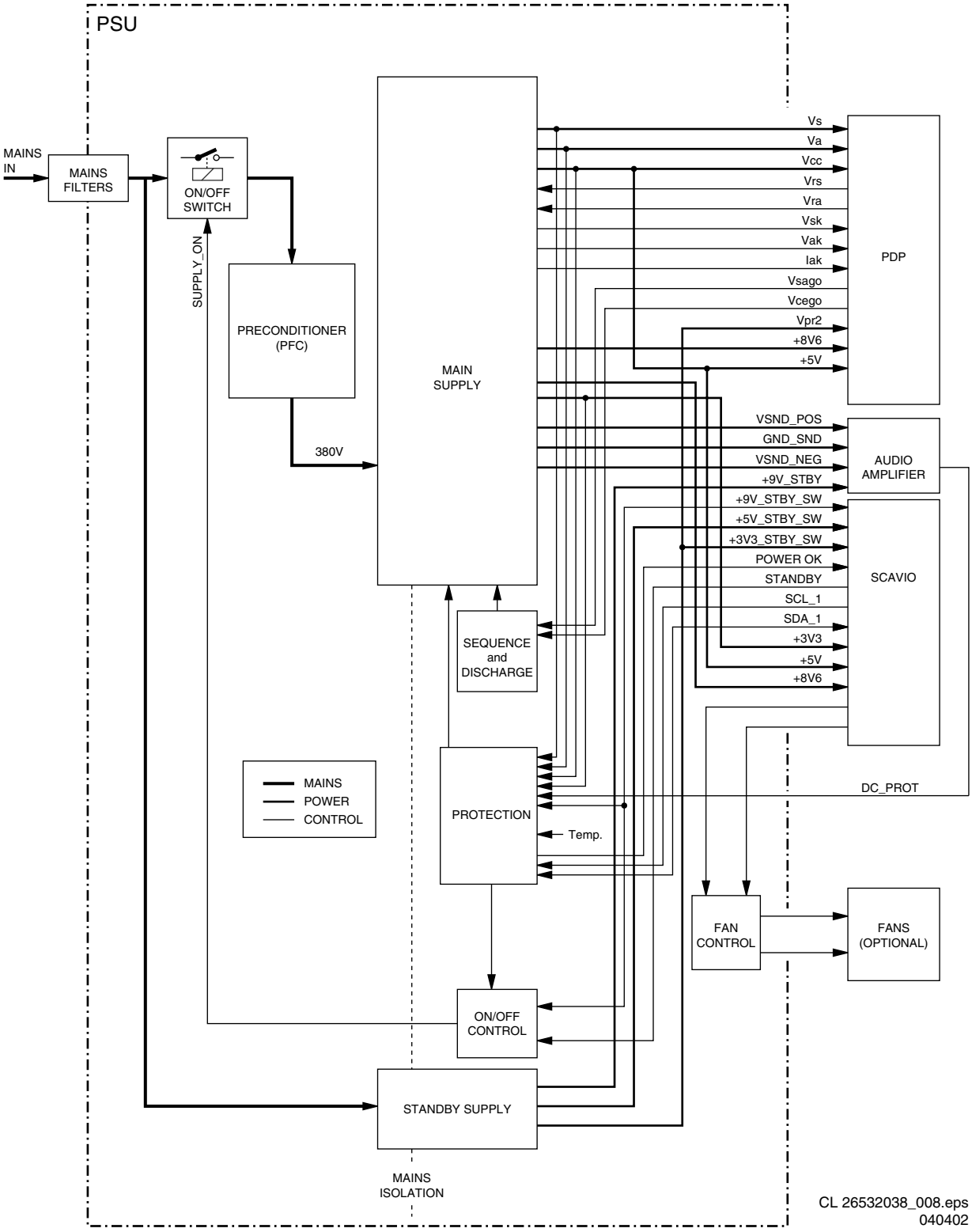


Figure 9-3 Power Supply

Table 9-1 I/O Overview Power Supply

Name	I/O	Value	Description
+3V3	Out	+3.3 Vdc	To supply small signal digital circuitry.
+3V3_STBY_SW	Out	+3.3 Vdc	To supply small signal digital circuitry, needing power in standby
+5V	Out	+5 Vdc	To supply small signal digital circuitry.
+5V_STBY_SW	Out	+5 Vdc	To supply small signal digital circuitry, needing power in standby
+8V6	Out	+8.6 Vdc	To supply the small signal analogue circuitry.
+9V_STBY	Out	+9 Vdc	Signal to functional ON/OFF switch.
+9V_STBY_SW	Out	+9 Vdc	Signal from functional ON/OFF switch.
DC_PROT	In	H/L	Signal from audio amplifier to switch OFF the power supply in case of a safety problem.
FAN_SP_1	In	H/L (TTL level)	PWM signal from uP to control optional fans (group 1).
FAN_SP_2	In	H/L (TTL level)	PWM signal from uP to control optional fans (group 2).
FAN_SUPPLY_1	Out	5 to 13 Vdc	Supply voltage for optional fans (group 1).
FAN_SUPPLY_2	Out	5 to 13 Vdc	Supply voltage for optional fans (group 2).
Iak	Out		Signal to measure 'Ia' in PDP (Iak= 1 x Ia).
Mains	In	110/240 Vac, 50/60 Hz	Mains voltage.
POWER_OK	Out	H/L (TTL level)	Signal to an interrupt pin of the uP, which indicates that the power supply is in regulation. If an error occurs, signal goes from H to L.
SCL_1	In	H/L	I2C clock line from uP.
SDA_1	In/ Out	H/L	Bi-directional I2C data line from/to uP.
STANDBY	In	H/L (TTL level)	Signal to switch the PSU to standby mode.
Va	Out	+30 to +70 Vdc	To supply the addressing circuitry in the PDP.
Vak	Out		Signal to measure Va in PDP (Vsk= 0.036 x Va).
Vcc	Out	+5 Vdc	To supply small signal digital circuitry in the PDP.
Vcego	In	H/L (H= +2 Vdc)	Signal to switch the low voltage supplies ON/OFF.
Vra	In		Signal to control Va (Va= 30 + (20 x Vra)).
Vrs	In		Signal to control Vs (Vs= 70 + (10 x Vrs)).
Vs	Out	+70 to +90 Vdc	To supply the sustain circuitry in the PDP.
Vsago	In	H/L (H= +2 Vdc)	Signal to switch the high voltage supplies (Vs and Va) ON/OFF.
Vsk	Out		Signal to measure Vs in PDP (Vsk= 0.029 x Vs).
VSND_POS	Out	+14.5 Vdc	To supply the audio amplifier panel.
VSND_NEG	Out	-14.5 Vdc	To supply the audio amplifier panel.

The Power Supply Unit (PSU) is designed to provide regulated output voltages for the plasma display panel (PDP) and the built-in electronic panels (such as e.g. the SCAVIO and Audio Amplifier panels).
It will house the Pre-conditioner, DC/DC converters and the Standby circuitry. In addition, this panel will house the protection and the (optional) fan drive circuitry.
The Mains inlet is mounted alongside the SCAVIO panel. It consists of the necessary high and low frequency mains filters.

The mains AC voltage is applied to the input filter and then fed to the standby supply. This supply is always operational and delivers the $+9V_{STBY}$ voltage.
The task of the main supply is to deliver the supply voltages for the several electrical circuits in the monitor.
It is switched via two single-pole relays, which are powered from the $+9V_{STBY}$ voltage and controlled via the SUPPLY_ON signal.
The reason to choose for a separate standby supply instead of a single flyback supply is the requirement to have a low standby power consumption.

The PSU consists of the following parts (which are described separately):
- Mains inlet and filter,
- Standby supply,
- Fan control (optional),
- Pre-conditioner,
- LLC supply,
- Aux. supply,
- Protections.

To understand the descriptions below, see also mentioned diagrams in Chapter 7.

9.2.2 Mains Inlet and Filter (Diagram P2)

Introduction
The mains filter provides common-mode and differential-mode filtering, to fulfil legal and self-imposed limits. Additional provisions are mains spikes and lightning protection.

Operation
The mains voltage is provided via mains inlet 0308, after which it is fused by a T6.3A fuse (item 1400).
The next part, the mains filter, is optional. It consists of an LC common mode filter section. This filter consists of two capacitors (items 2402 and 2403) from both phase and neutral to ground (to reduce the leakage current) and an inductor (5401). Interferences on one of the phases are shorted to ground via these capacitors.
Inductor 5401 also provides a differential-mode filtering with capacitor 2400. Resistor 3401 discharges this capacitor after the mains is disconnected.
A second common mode filter is made around coil 5402 and capacitor 2401.

Resistor 3400 is a high energy VDR. The advantage of this VDR is that it can handle 400 V_{AC} without risk of fire. At high voltage peaks (e.g. lightning surge) on one of the phases, the resistance of VDR 3400 will be very low, causing fuse 1400 to interrupt.
At a lightning surge on both phases with respect to chassis ground, mains filter 5401 will form a high resistance, through which the voltage will rise very sharply.

To prevent flashovers, a spark-gap/ resistor combination (items 1402 and 3404) is implemented.

The high-ohmic resistors 3402 and 3403 are connected between neutral and chassis ground. They are required by safety regulations.

9.2.3 Standby Supply (Diagram P2)

Introduction
The standby supply is a separate power supply, meant to reduce power consumption of the Flat TV monitor in standby mode. The standby supply operates on the AC voltage from the input filter part, and has to deliver a stable 9 V voltage.

It has three **mains isolated** outputs, and one **'hot'** output:
- **+9VSTBY** (called +9VSTBY_SW after the 'on/off' switch 1101), to power the 'on'/'off' relays in the pre-conditioner.
- **+5VSTBY_SW** derived from the +9V_{STBY} via voltage regulator 7540.
- **+3V3STBY_SW**, to supply the µP of the PDP.
- **25V_HOT**, to supply the LLC controller.

The standby supply is also connected to the pre-conditioner output (400V_HOT), in order to deliver a voltage as long as possible, after switch 'off' and at mains dips.

Operation
The standby supply is always operational when the AC input voltage is present, so even when the POWER switch is in the 'off' position. After a small rectifier (D6512/6513) and buffer capacitor (C2503), the DC voltage is applied to an SMPS (switched mode power supply).

The SMPS itself is build around IC7500, a 'TINYSwitch TNY256'. This IC contains a control circuitry and a power MOSFET. It uses a simple 'on/off' control loop to regulate the output voltage. The generated +9V_{STBY} voltage, at the secondary side, is rectified by D6504 and smoothed by C2508. The supply for the TNY256 on pin 5 comes via resistor R3506 and L5500.

By using secondary sensing, a very accurate standby voltage and high efficiency is achieved. The sensing circuit uses a TL431 as reference voltage/error amplifier. Optocoupler 7501 is used for the mains isolation.
When the output voltage rises, the reference voltage on the TL431 will exceed 2.5 V and the current through this device and the optocoupler LED will increase. By this, the optocoupler transistor will conduct more. When this current (at pin 4 of IC7500) exceeds 50 uA, the MOSFET is switched 'off', and the output voltage will drop. When this current drops below 40 uA, the MOSFET is switched 'on' again.

During the time that the MOSFET is 'on', the IC has no supply voltage. To overcome this period, the energy stored in the bypass capacitor C2513 is used. This capacitor is charged during the time the MOSFET is 'on'.

As the TNY256 is sensitive for transients (mains spikes), a 'peak clamp' circuit (300 V zenerdiodes 6501 and 6502) is used to limit the voltage to a safe level.

9.2.4 Fan Control (Optional, Diagram P4)

For ceiling mount or portrait-mode use, there is foreseen in four optional fans, grouped per two. The temperature within the monitor is measured via a sensor (R3372, KTY81) on the PSU. This sensor is, via A/D converter (item 7530 on the SCAVIO), connected to the OTC. According the temperature within the cabinet, the OTC-software will drive the two PWM outputs of the OTC. These outputs (FAN_SP_1 and 2) are connected to the PSU, where for each signal, a corresponding voltage is generated to supply the fans. These voltages (FAN_SUPPLY_1 and _2) are proportional to the duty cycle of the corresponding PWM signals.
The OTC senses the temperature every 5 s. If it has reached T-alarm, and this value has been measured three times consequently, the monitor will go into protection, and a error-code is generated.

9.2.5 Pre-conditioner (Diagram P5)

Warning: the pre-conditioner does **not** provide mains isolation.

Introduction
The European Law describes a reduction of mains harmonics for apparatus with a power consumption above 75 W. Therefore the pre-conditioner is designed. This module serves as the interface between the mains input and the V_S/V_A supply. The advantage of a pre-conditioner is (compared to a mains input filter):
- Reduction of mains harmonics to legal limits.
- Lower mains current for the same output power.
- Power factor close to 1.
- Stable regulated output.
- Small and low weight.

The input voltage of the pre-conditioner is universal, between 95 and 264 V_{AC}. The output is 400 V_{DC} (400V_HOT) with a maximum output power of 300 W. This output voltage is delivered to the V_S supply.

Operation

Start-up
The two relays (1450 and 1460, diagram P2) are controlled via the SUPPLY_ON signal. This signal will become 'high' when the +9V_STBY_SW, the STANDBY (from the OTC), and the LATCH signal are 'ok'. It then switches indirect relay 1450 via transistor 7460 and so enables the use of a small low voltage switch.
To protect rectifier 6600 and relay 1450, the inrush current is limited to a maximum of 20 A by charging the capacitor 2605 through two serial PTCs (3450 and 3451) and two NTC's (3452 and 3453).
After approximately 0.5 sec, relay 1460 is activated. This relay will short the PTCs. The advantage of using an NTC, is the fact that the resistance varies with the current and hence the mains voltage. At a high mains voltage, the current is lower for the same power.

Two clamp diodes 6605 and 6606 charge output capacitors C2616/2617 to the peak voltage of the mains input. During normal operation, both diodes are blocked because of the output voltage of 400 V_{DC}, and will only conduct if there is a mains spike or an output dip.

Capacitor 2616 delivers via R3668 the start-up voltage at pin 16 of IC7650. After the start-up cycle, IC7650 is supplied via auxiliary winding 1-2. Capacitor C2663 is charged during the cycle that MOSFET 7610 conducts. While MOSFET 7610 is switched 'off', this capacitor transfers its energy via D6661 to the input of stabiliser IC7660. The 15 V output voltage of this IC is fed via D6665 to V_{CC} pin 12 of IC7650.
The slow start function is realised by the circuit consisting of transistor 7654, D6654, R3654, and C2654.

Normal Operation
An up-converter circuit is used for the pre-conditioner. The switching frequency of the converter is chosen much higher than the mains frequency. It is therefore possible to consider the supply as constant, during every high frequency period, and the envelope of all voltage steps during the low frequency period approximates a half sine wave.
The output voltage of the pre-conditioner equals the input voltage, when the MOSFET is continuous switched 'off', and increases while the MOSFET is switched 'on'.

The rectified mains input voltage is connected to pin 5 of IC7650 via voltage divider R3650 and R3651. This voltage is proportional with the mains input, and is used to change the duty cycle of the pulses, which are generated at pin 11. Because the width of these pulses is not small enough, the circuit around transistors 7640 and 7641 is added. It decreases

the duration of the square wave by 500 ns (this value is set by R3640 and C2640).
A demagnetisation winding (pin 1-2 of L5600) detects when there is no energy in the transformer. This information is fed to IC7650 pin 7 and this is used to switch 'on' the MOSFET (7610). In this way, the dissipation is very low, combined with a low EMI.
The MOSFET 7610 is switched 'off' at high currents, up to 15 A. To reduce dissipation, this is done at high speed for which 'turn off driver' T7608 is used.

The output voltage (400 V) is divided by R3670 and R3671 and connected to pin 3 of IC7650. A change in the load will adjust the duty cycle of the gate pulse at pin 11, in order to keep the output voltage constant. Therefore, there is no need to adjust the output voltage by means of a potentiometer.

Protections

Current Protection
The current through FET 7610 flows also through the sense resistors 3614 and 3615. The voltage across these resistors is fed to pin 6 of IC7650. If the current exceeds its reference level, the pre-conditioner will switch 'off'. A filter, formed by C2666 and R3666, avoids unnecessary protection triggering due to spikes.
C2665 and R3665 on pin 13 determine the maximum oscillating frequency.

9.2.6 LLC Supply (Diagram P6)

Introduction
The V_S supply (70-90V) is based upon the so-called LLC converter technology (also used in the MG3.1 and FTV1.9). It is used to supply the power of the sustain pulses, which generate the light in the PDP. The voltage is set by a reference DC voltage (V_{RS}), coming from the PDP.
The V_A voltage (derived from V_S) is used to supply the power for driving the addressing electrodes of the PDP. The value of V_A is also depending on a reference voltage (V_{RA}) coming from the PDP.

The main supply hosts the following supplies:
- V_S supply, via a LLC converter.
- V_A supply, via the LLC supply and a down converter.
- V_{CC}, via a flyback converter.
- 3V3, via a down converter.
- Audio amplifier supplies (V_{SND_POS} and V_{SND_NEG}), via a transformer.

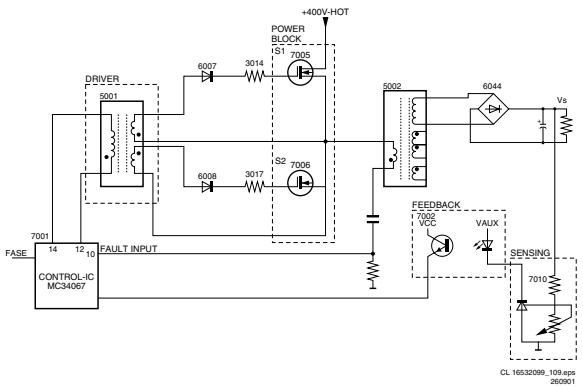


Figure 9-4 V_S Supply

The start-up voltage for the control IC 7001 is derived from one phase, the IC starts to oscillate, and alternately S1 (7005) and S2 (7006) are driven into conduction with a dead time in between. This effects that, via the resonance circuit and the MOSFETS, energy is stored into transformers L5002/5004 and capacitor C2001. Compared with the FM23, two transformers are used, to be able to deliver the higher power for the 42" PDP.
The secondary voltages are rectified and smoothed. These voltages are, via a voltage divider, fed to the optocoupler that influences the oscillator frequency of the control IC and stabilises the secondary voltages. If the current becomes too high, the supply is switched 'off' via the fault input of the control IC.

Advantages:
- High efficiency (more then 90%, other supplies 75%).
- Less radiation.
- More cost-effective (two MOSFETS of 400 V are cheaper than one MOSFET of 600 V).

Disadvantages:
- Very low power stand-by impossible.
- Realisation and stabilisation is more complex.

Operation V_S Supply

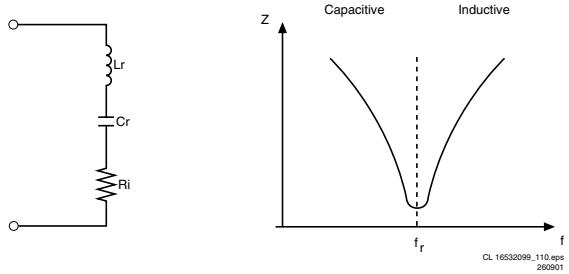


Figure 9-5 Impedance Characteristic

General
The LLC supply is a serial resonance power supply. The coil, resistor, and capacitor form a trap at the resonance frequency f_R. The impedance is frequency dependent. The smallest impedance is at the resonance frequency (f_R), at the right side of f_R is the inductive part, and at the left side the capacitive part. The supply works in the inductive part, since higher frequencies causes minor losses.
Stabilisation is realised, by regulating the frequency as function of the output voltage (V_{S_UNSW}) and power. The load is stabilised by influencing the series-loop. The higher the frequency, the lower the output power.

The supply voltage of the control IC comes from the 25V_HOT voltage of the standby supply (via stabiliser 7093), and is lead to pin 15 of the IC. The IC starts to oscillate. This supply line has a short-circuit protection via opto-coupler 7003; when the STBY supply is regulating, the current through the opto-coupler is amplified and will deliver power to the IC.

Control is done in the usual way by a TL431 at the secondary side. V_{RS} is mixed into the feedback voltage, using an additional TL431 (7011 at schematic P6). V_{RS}, a control signal coming from the display, influences the output of the V_S supply. The output voltage of the V_S supply varies according the following formula: $V_S = 70 + (10 * V_{RS})$. Via this stabilisation circuitry for V_S, the output voltage is stabilised (if necessary, it is possible to adjust the voltage, via potmeter R3026). The V_S is fed via a voltage divider to IC7010 (TL431).
If the voltage at pin 3 of IC7010 is higher than 2.5 V, a current will flow from cathode to anode. This current flows also through the secondary side of the optocoupler 7002.
The voltage at pin 7 of the MC34067, determines the output frequency. The higher this voltage, the higher the output frequency. Thus, if the voltage on pin 7 increases, the frequency increases and V_S decreases.
So, when the output voltage rises, the voltage at the reference IC7010 also rises, this causes the current through the diode of the opto-coupler to rise. The transistor of the opto-coupler

conducts more, as a result of which the voltage at pin 7 of the MC34067 increases.
The output voltage of the error amplifier gets lower, and the current through R3005 increases.

Accurate Over Voltage Protection is added, using a TL431 (7304) as reference/comparator and an additional optocoupler (7003) that acts on the fault input pin 10 of the MC34067P (see also 'Protections Main Supply').

The Controller

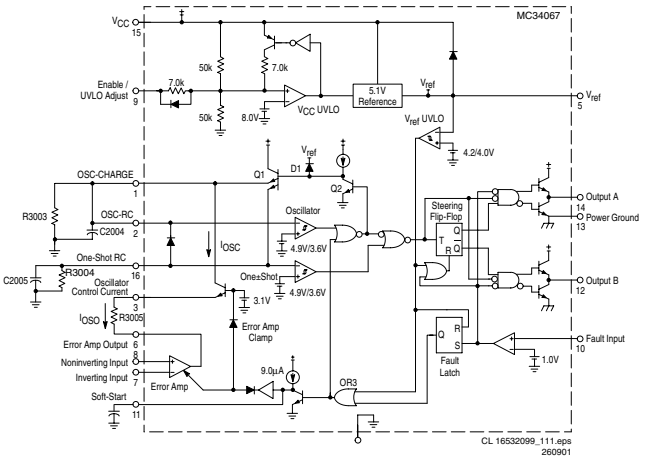


Figure 9-6 MC34067

The MC34067P controller, is used for the following reasons:
- Zero voltage switching.
- Variable frequency oscillator (above 1 MHz).
- Precision one shot timer for the dead time.
- 5 V reference output.
- Double, high current totem-pole output.
- Soft start.
- Wideband error amplifier.
- Fault input (protection).

The oscillator circuit is build around an internal comparator with two threshold-voltages: 4.9 and 3.6 V.
C2004 is first charged via transistor Q1. If the voltage across C2004 is more then 4.9 V, the output of the upper comparator becomes low, the NOR-port output will be high, and Q1 will be blocked because the base will be shortened by Q2. C2004 will be discharged via the resistors R3003 and the oscillator control current (I_{OSC}).
If the voltage across C2004 is below the lower threshold (3.6 V), transistor Q1 is conducting and the capacitor is charged again. The oscillation frequency is modulated by the oscillator control current.
The discharge current increases, when pin 3 is loaded even more; thus the lower the voltage on pin 3, the higher the oscillator control current and the higher the frequency. The maximum frequency is reached when the output of the error amp is minimal (0.1 V). Thus, R3005 determines the maximum frequency.
The minimum frequency is reached, when I_{OSC} current is zero: C2004 then discharges only via the resistor R3003.

One Shot Timer
The one-shot timer is present, to de-activate both outputs simultaneously, and to provide a dead time, so that only one output will be activated.
The one-shot capacitor (C2005) is first charged by Q1. The one-shot period begins when the oscillator comparator is switched 'off' by Q1. The one-shot capacitor is discharged via the parallel resistance (R3004): if this voltage gets lower than the lower threshold of 3.6 V, the comparator will be high and controls the flip-flop, which makes one of both outputs high.
If Q1 is re-conducted through the oscillator comparator, the one-shot capacitor is re-charged.

Fault Detector Input
At pin 10, there is a fault detector input. If this voltage reaches 1 V, the output of the OpAmp goes high, and both drive outputs are switched 'off'.
In addition, the output of OR3 will be high via the 'fault latch'. The output of OR3 drives Q1, so both the oscillator and the one-shot-capacitor remain charged. Via OR3, the soft-start capacitor is discharged.

Soft-start
Due to the soft-start circuit, the oscillator starts with maximum frequency. The low voltage on the soft-start capacitor (C2027) is buffered and keeps the error amplifier output low (I_{OSC} = max -> f_{OSC} = max).
The capacitor is charged with a current of 9 µA, the output of the buffer gets high, and the error amplifier input takes charge of the oscillator control current.

Driver stage
The two secondary windings of the driver transformer are wound in opposite directions and control the two switching MOSFETs. The primary winding of the driver transformer is alternately controlled by the two totem-pole outputs of the controller. Cross-conduction of both MOSFETs is prevented by the dead time.
The gate of each MOSFET is controlled via the resistors 3014/3017 and via the diodes 6007/6008. The transistors 7007/7008 discharge the gate faster by switching 'off'. The diodes 6017/6028 at the base-emitter of 7007/7008 prevent the zener effect of these transistors. The zener diodes at the gate-source of 7005/7006 are for ESD protection. C2011 and C2014, form the capacity for the series resonant circuit.

MOSFET switching
The total switching time can be distributed over 12 phases with different current paths. Only four phases are discussed to simplify the explanation:

Phase 1 (S1 closed, S2 open)

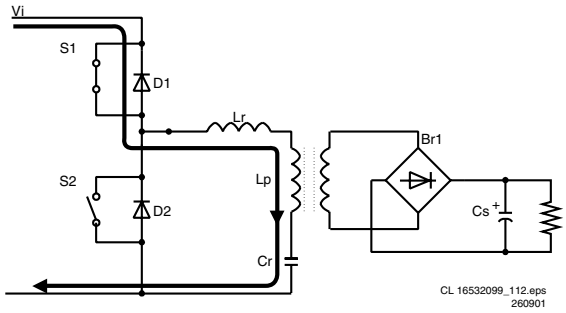


Figure 9-7 Phase 1 Resonance Supply

The gate of MOSFET 1 is positive, which causes S1 to close. The input voltage Vi of 400 V_{DC}, provides a current flow through S1 and the series circuit. At the same time, a current flows through the rectifier diodes in the secondary winding, which will charge capacitor Cs.
The current through Lr starts negative, but it is increasing to change polarity.
Capacitor Cr is charged sinusoidal, while the voltage at Lr drops. This makes the current drop.

Phase 2 (S1 open, S2 open = dead time)

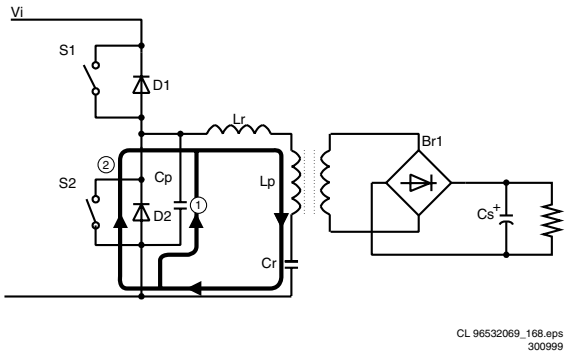


Figure 9-8 Phase 2 Resonance Supply

Before the current reaches zero, S1 is opened. Now, both MOSFETs are not conducting. However, the current through the coils wants to continue. The capacity Cp releases its load to the series circuit, and the voltage at Cr continues to rise (Cp is the sum of several parasitic capacities).
1) The voltage at the drain of MOSFET 2 drops, because Cp is discharged at this moment [1]. This causes a voltage inversion across Lr and Lp. The secondary winding begins to feed back, charging capacitor Cs.
2) The voltage becomes negative, and diode D2 starts to conduct [2]. The secondary bridge remains conducting.

Phase 3 (S1 open, S2 closed)

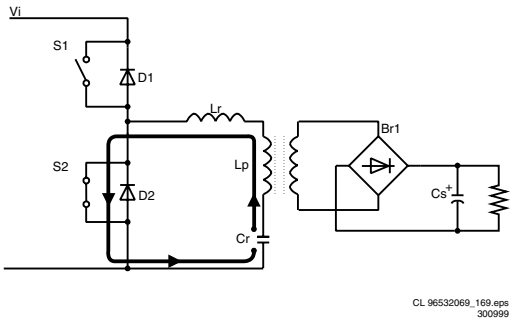


Figure 9-9 Phase 3 Resonance Supply

The gate of MOSFET 2 is becoming high. The current through D2 is taken over by MOSFET 2. The switching losses are negligible, because the voltage across the switch is now approximately 1 V.
The current through Lr starts negative, but is increasing to change polarity. A current flows through MOSFET 2 and the series circuit. The bridge remains conducting, but its current gets zero because of the decreasing voltage across Lp. This is caused by the discharge of capacitor Cr. The voltage at capacitor Cr is decreasing sinusoidal and so is the voltage across Lp and Lr.

Phase 4 (S1 open, S2 open = dead time)

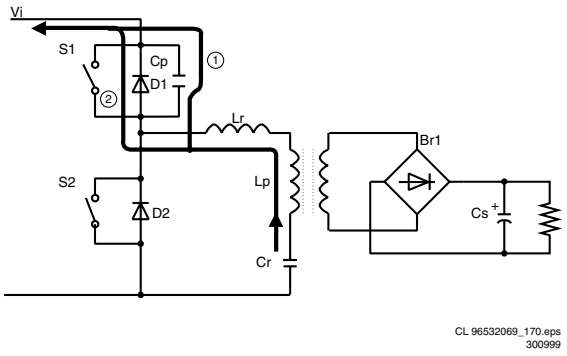


Figure 9-10 Phase 4 Resonance Supply

Before the current reaches zero, S2 is opened. Now, both MOSFETs are not conducting, but the current through the coils wants to continue. The capacity Cp releases its load to the series circuit, and the voltage at Cr continues to fall (Cp is the sum of several parasitic capacities).
1) The voltage at the drain of MOSFET 2 increases, because Cp is discharged at this moment [1] (Cp was charged to 400 V). This causes a voltage inversion across Lr and Lp. The secondary winding begins to feed back, charging capacitor Cs.
2) The voltage becomes higher than 400 V, and diode D1 starts to conduct [2]. The secondary bridge remains conducting.

Protections MC34067

Over Current Protection (OCP)
The voltage at R3021 is a criterion for the current, which flows through the primary winding. Via C2015 and D6010, the negative information is clamped at -0.6 V. The total amplitude is rectified via D6009 and C2010, and via R3020 and TS7009 supplied to the fault input (pin 10) of the controller.
When the fault input is higher than 1 V, the protection is activated.

Over Voltage Protection (OVP)
The voltage at R3010 is the take-over-winding voltage. This voltage is also supplied to pin 10 of the controller via a voltage divider R3010/R3011 When the fault input is higher than 1 V, the protection is activated.

Soft-start Over Current Protection
If short-term ‘over current peaks’ occur, the frequency is adapted. The voltage at R3021 is clamped at -0.6 V via C2015 and D6010. The total amplitude is rectified via D6011 and C2008, and supplied to the 'capacitive' thyristor TS7017/18 via R3012.
When the voltage at the emitter of TS7017 gets higher than 5 V, the soft-start capacitor C2027 is discharged and the frequency increases. Because of this, the V_S will drop. If this voltage remains 5 V, the supply is interrupted (hick-up).
This circuit is adjusted in such a way, that the voltage does not drop too much if a flash occurs.

9.2.7 Aux. Supply (Diagram P7)

The Aux. supply part, hosts the supplies, which are derived from the V_S supply:
- V_A supply,
- V_{CC} supply,
- 3V3 supply,
- Audio supply (V_{SND_POS} and V_{SND_NEG}).

In addition to the FM23 monitor, a circuit is added (around 7143, 7144, and 7145), which takes care that the V_A and V_S supplies are discharged immediately after set switch 'off'. This to prevent discharge spikes of the elcaps. The circuit will ground the supply voltage of IC7112 as soon as its trigger line (+9V_STBY_SW) is switched 'off'.

V_A Supply

The V_A voltage is derived from the LLC supply '77-100V' line via a down converter principle. Control IC TEA1507 (item IC7112) and MOSFET TS7117 are used.

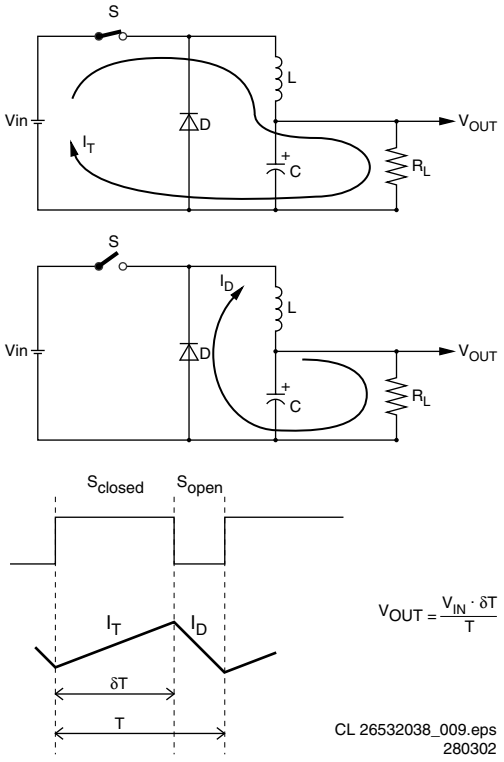


Figure 9-11 Principle of Down Converter

After closing switch 'S', the linear in time increasing current I_T, will charge capacitor C.
Opening switch 'S' will generate a counter-e.m.f. (= reverse voltage) in coil L, trying to maintain current I_T. This is possible via diode D (this diode is also called 'freewheel diode').
Therefore, after opening 'S', the magnetic energy stored in coil L will be transferred to electrostatic energy in capacitor C. The V_{IN} will only supply current during the time that 'S' is closed while a constant current is flowing through R_L.
V_{OUT} is directly proportional with V_{IN} and the time that 'S' is closed and reverse proportional with period time 'T'. Therefore, by changing the duty cycle, it will be possible to control V_{OUT}.
To apply this on the FM24 (diagram P7): replace switch 'S' by FET TS7117, coil L by L5120, diode D by D6120, C by C2121, V_{IN}= 77-100V, and V_{OUT}= V_A.

Stabilising is done in the same way as for the V_S supply. V_{RA} is mixed into the feedback voltage, using an additional TL431 (7011 at schematic P6). Control signal V_{RA}, coming from the display, influences the output of the V_A supply. The output voltage of the V_A supply varies according the following formula: $V_A = 30 + (20 * V_{RA})$.

V_{CC} Supply

This part delivers, besides the V_{CC} voltage (+5 V), also a +12 V (for optional Fan control) and derived from that, an +8V6 (for small signal analogue circuitry).
The V_{CC} voltage is derived from the V_S voltage via the flyback converter principle. Control IC TEA1507 (item 7212) and MOSFET 7212 are used.

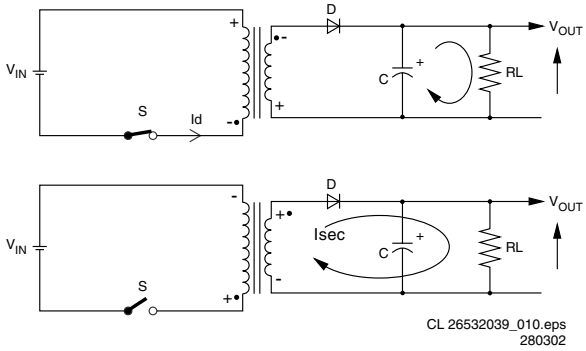


Figure 9-12 Principle of Flyback Converter

After closing switch 'S', the current I_D will increase linear in time. The magnetic energy in the primary coil is directly proportional with the self-inductance of the coil and current I_D (thus with the time the switch is closed). The voltage polarity at the secondary winding is negative (due to different winding direction), meaning that diode D will block. Capacitor C will discharge via R_L, V_{OUT} will decrease.
Opening switch 'S' will generate a counter-e.m.f. in the primary winding, trying to maintain current I_D. Through this the polarity of the secondary voltage will inverse. The magnetic energy, stored in the coil, will now be transformed to the secondary side. Diode D will now conduct, capacitor C will be charged and U_{OUT} will increase.
To apply this on the FM24 (diagram P7): replace switch 'S' by FET TS7217, coil L by L5220, diode D by D6224, C by C2224, V_{IN}= V_{S_UNSW}, and V_{OUT}= V_{CC}.

3V3 Supply

The 3V3 voltage, is directly derived from the LLC supply (+15V line). Via a fuse (1005/1045), this voltage is rectified by diodes 6021/6045 and smoothed by C2022. Via control IC L4973V (item 7260), the 3V3 voltage is generated. This IC contains a complete down converter, with integrated MOSFET.

Audio Supply

This is a 'floating' symmetrical supply (±14.5 V) derived from V_S via transformer 5290. Because this voltage is tightly coupled to the V_S voltage, this voltage varies considerable, between 11 V (max. load, V_S = 70 V) and 20 V (min. load, V_S = 90 V).
The Audio ground is connected to the normal secondary ground, with a capacitor (C2290) and a resistor (R3292) in parallel, to have the possibilities to suppress spurious oscillations.

9.2.8 Power Supply Protections (Diagram P3)

Introduction

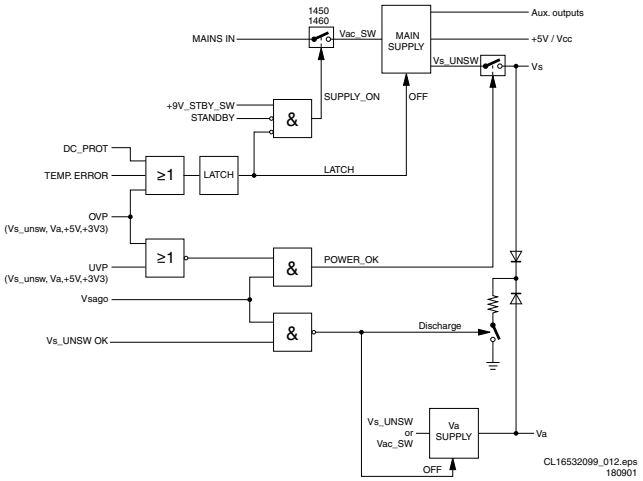


Figure 9-13 Protections

In general, all efforts need to be taken, to make a safe power supply. Therefore, all major outputs are monitored with respect to over- and/or under voltage. All protections are handled by hardware. The software only monitors the hardware to generate error codes for service.
Via I^2C, errors of the power supply are transmitted to the µP on the SCAVIO panel. If an error occurs, POWER_OK will change from 'high' to 'low'. The errors are transmitted to the µP, on the following ports and pin numbers of the I/O expander PCF8574AT (item 7370):

Table 9-2 IC7370 Inputs

Pin	Name	Description
4	Vs	Detection of under- or overvoltage on Vs
5	Va	Detection of under- or overvoltage on Va
6	+5V	Detection of under- or overvoltage on +5V
7	+3V3	Detection of under- or overvoltage on +3V3
9	OVP	Detection of overvoltage on Vs, Va, +5V or +3V3
10	Switch	Detection of functional switch
11	DC_PROT	Detection of DC_PROT going high
12	TEMP	Detection of over temp. inside power supply

This POWER_OK signal is connected to an interrupt pin of the OTC, in order to be read as fast as possible. This is very important in case of a time limited error like over voltage. After detection of the error, the control system will log the error in NVM, and transmit the first occurrence back to the power supply through the I^2C bus.

Note: The POK signal is fed to buffer 7366, together with the '8V6 UNDER VOLTAGE' and 'SWITCH' sensing. The output of this buffer, the POWER_OK line, will follow the inputs.

Operation

V_S Protection
Detection of over- or under voltage on V_{S_UNSW} by comparators IC7308-A and -B. If this voltage exceeds certain levels (set via voltage dividers), the protection will activate the Power OK (POK, active 'low'), which will shut down the set.

V_A Protection
Detection of over- or under voltage on V_A by comparators IC7308-C and -D. If this voltage exceeds certain levels (set via voltage dividers), the protection will activate the Power OK (POK, active 'low'), which will shut down the set.

V_{CC} Protection
Detection of over- or under voltage on V_{CC} (+5 V) by comparators IC7330-A and -B. If this voltage exceeds certain levels (set via voltage dividers), the protection will activate the Power OK (POK, active 'low'), which will shut down the set.

+3V3 Protection
Detection of over- or under voltage on the +3V3 voltage by comparators IC7330-C and -D. If this voltage exceeds certain levels (set via voltage dividers), the protection will activate the Power OK (POK, active 'low'), which will shut down the set.

OVP protection
This line detects, if one of the above mentioned voltage protections is an over voltage protection. Therefore, this works in combination with the above mentioned under-/over voltage protections.

Latch Protection
When an OVP-, DC-, or Temperature protection occurs, thyristor 6348 is fired and the LATCH signal is made 'low'. This signal will switch 'off' the main supply and prevents that the supply is switched 'on' again, as long as the protection is active. In addition, the V_{CEGO} signal can activate the LATCH signal (via TS7352 and 7348), but this is temporarily. This is done for correct start-up behaviour.

DC Protection
Detection of a DC voltage on the audio amplifier outputs. If a DC voltage is detected, TS7362 will activate the Power OK (POK, active 'low'), which will shut down the set.

Temp Protection
Detection of the temperature (via PTC 3368) in the power supply by comparator IC7366-A. If this voltage exceeds a certain level (set via voltage dividers), the protection will activate the Power OK (POK), which will shut down the set.

9.3 VGA Connector Panel (Diagram VGA)

The Video Graphics Array (VGA) panel serves as an interface between the peripheral VGA equipment (Receiver box, PC, etc.) and the SCAVIO panel. Some specifications of this panel:

- Two NVMs are present, which hold identification data for the DDC line.
- Further, there are buffers present for the incoming and outgoing sync signals.
- RC_OUT cinch for linking with other equipment.
- Provision to terminate the incoming sync lines with 75 Ω via the EBOX_PRESENT line.

For a description, see the next **SCAVIO** chapter.

9.4 SCAVIO Panel (Diagrams SC)

The Scaler Control Audio Video Input Output (SCAVIO) panel contains:

- All the input connectors,
- Analogue and digital video processing,
- Scaler (co-processor)
- Interface to the PDP,
- Audio processing (excluding the audio amplifier),
- OTC (main processor), and
- RS232C in/out.

Note: There are two versions of this panel, a *Basic* and an *Enhanced* version. Therefore, a lot of components are therefore not mounted for the *Basic* version.

For the circuit description, we divide the board into the following parts:
1. Supply
2. Video processing
3. Audio processing
4. Control

9.4.1 Supply

See figure 'Power Supply Part' in paragraph 9.1.5.

9.4.2 Video Processing (Diagrams SC3, 4, 5, 6, 10, 11 and 12)

Introduction

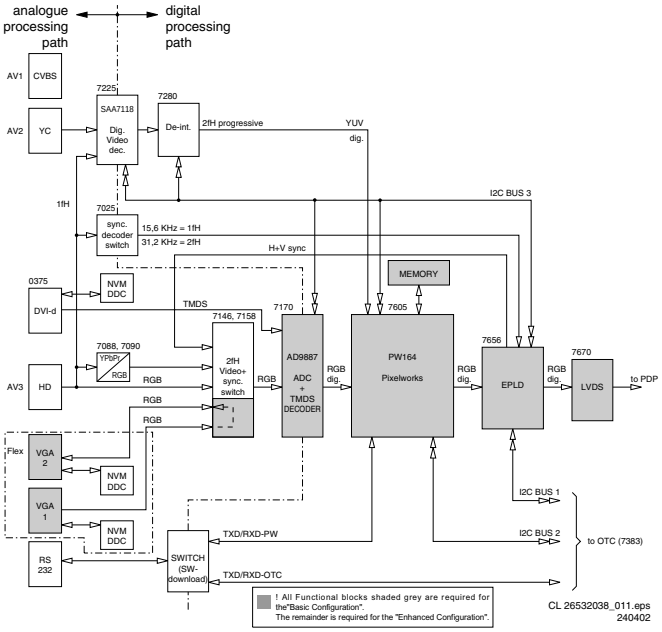


Figure 9-14 Video path

This mainly consists of a small **analogue** processing part and a larger **digital** signal processing part.
The video inputs like CVBS, YC, High Definition RGB, or YUV (1fH and 2fH), VGA, and DVI-D are received and processed.
The YPbPr (2fH) is discretely converted to RGB, whereas the YCbCr (1fH) is processed in the SAA7118 Digital Video decoder. The base-band video inputs (CVBS and YC) are output from the digital video decoder as digital YUV, which are then further processed by the PixelWorks Scaler.
The VGA signals are first AD converted and then processed by the PW Scaler.
The digital input on the DVI is first decoded by the TMDS decoder inside the AD9887 and then processed by the PW Scaler.
The PW Scaler output is going through an EPLD and then via the LVDS transmitter to the PDP (Plasma Display Panel) as differential serial data. The PDP is based on ALiS (Alternate Lighting of Surface) technology and is an interlaced display, with separate ODD and EVEN fields to be displayed.

Analogue Video
This part describes the analogue video and synchronisation path of all inputs, until it reaches the 'analogue digital converters' of either the AD9887 (ADC+TMDS Decoder) or the SAA7118E (Digital Video Decoder).
Also the switching part is described and the necessary control signals.
In principle, all video control functions are done by the PixelWorks processor.

Note: This part also includes the VGA connector panel that is mounted on top of the SCAVIO panel.

Inputs
There are five video inputs, which are divided in three types:
- **VGA** (2fH): named VGA1 and VGA2. Both are 15-pole SUB-D connectors for RGB and HV, and are situated on the VGA connector panel. For automatic identification by a PC, each VGA input is foreseen with a DDC NVM IC. VGA2 is set default as loop through of VGA1. In the *Enhanced* version, VGA2 can be switched as output, via the control signals VGA2_OUT and VGA2_EN.
- **YPbPr/RGB** (combined 2fH and 1fH): named AV3 and suitable for YCbCr/HD-YPbPr/HD-RGB + HV. These are cinch inputs. YPbPr and RGB are seen as separate inputs by the HW and must be properly selected by SW.
- **CVBS like** (1fH): named AV1 for CVBS and AV2 for Y/C. These are also cinch inputs.

Video Path
The 1fH signals (including YPbPr) are buffered (item 7113/21/17) and go directly to a digital video processor, the SAA7118E (item 7225 on diagram SC5), where they are converted into a digital signal.

The 2fH signals are also buffered; both YPbPr (item 7074/84/79) and RGB (item 7141/38/35) buffers get the same input signals.
When YPbPr signals are connected, the correct input must be selected, to get a picture with proper colours. Thus, the signals must pass a video matrix (item 7088/90, see diagram SC3), where they are converted into RGB. There are two matrices, an NTSC and an ATSC. With the MATRIX_SEL signal, the correct matrix is chosen (item 7089). The detection is done automatic, by an algorithm in the EPLD.
After the matrix, the signals enter a clamp/blanking circuit (7102/03/04 and 7100), for the removal of the residual sync signals. The control is done via the lines HD_BLANKN and HD_CLAMPN coming from the EPLD.

All RGB signals come together at 4-pole switches (item 7146/58), one for each colour, where they are switched to the AD converter item 7170 (R_ADC, G_ADC and B_ADC).

Sync Path
All incoming H and V sync signals go to a 4-pole switch (item 7009) where SYNC_SEL and VIDEO_SEL_2 determine, which signal is available on the ADC.
Before this switch, the VGA sync path is rather straight, only 1 switch (item 7007) is added for the VGA2 sync signals, which determines if VGA2 sync is input or output (VGA2_OUT).
In the *Basic* configuration, these switches are omitted, and replaced by jumpers (4009/4010).

The external sync (AV1 - 3) signals are treated differently. Both H_HD_EXT and V_HD_EXT go to three circuits:
- A comparator circuitry with an LM319 (item 7025), to ensure both sync pulses are always positive going (H and V_SYNC_CMP),
- A level detection circuitry (items 7000 to 7002), to detect if the sync is of TTL level (H and V_SYNC_TTL),
- A positive/negative going detection circuitry (items 7006 to 7010), to indicate the polarity of the sync in case of TTL level (H and V_SYNC_POL_N).

All above-mentioned signals go to the EPLD (see diagram SC11) for further processing.

Processed sync signals H_HD and V_HD coming from the EPLD, are also switched to the ADC (H_ADC and V_ADC) along with the proper RGB signals (R_ADC, G_ADC and B_ADC).

Digital Video

This part describes the digital video path on the SCAVIO panel, starting at the AD converters in either the AD9887 (item 7170) or in the SAA7118E (item 7225) and ending at the output for the PDP.
For both the *Basic* as the *Enhanced* version, everything 'after' the PixelWorks chip, is equal.
For the *Basic* version, the input for the PixelWorks only consists of the 'Graphics path'.
For the *Enhanced* version, it is both the 'Graphics path' as the 'Video path'.

The SCAVIO panel contains the following functions in the video path:

1. The 'YPbPr to RGB matrix' and '2fH Video+Sync Switch' are explained above in the 'Analogue Video' part.
2. The 'Digital Video' path containing the Digital Video Decoder and the De-interlacer.
3. The 'Digital Graphics' path containing the ADC+TMDS decoder.
4. The 'Scaler' which is the PixelWorks (PW164-10R) plus Memory.
5. The 'EPLD' for sync decoding and video manipulation.
6. The 'LVDS' encoder.

The Digital 'Graphics Path'

This is a straightforward application of the Analogue Devices AD9887 (item 7170). Inputs for this device are:

- FTV Receiver box,
- VGA formats (up to SXGA@75 Hz),
- 2fH RGB+HV (only in *Enhanced* version),
- 2fH YPbPr, which is converted to RGB by the 'YUV to RGB' matrix (only in *Enhanced* version),
- DVI-d (only in *Enhanced* version).

Analogue input:

The AD9887 is meant to sample 'pixel synchronous'. To achieve this, a (software) driver is running on the PixelWorks processor (PW). After hooking up a source to the AD9887, the PW starts counting the number of lines per field and calculates the H-period time. With these two values, it determines the exact match or the closest match out of a look-up-table (LUT) with VGA standards. When the correct standard is determined, the PW will set the AD9887 I^2C registers to the correct value. The AD9887 should now sample with exact the same frequency as the incoming standard requires. This is done to get an optimal picture performance.
It also is a 'must' when a computer graphics card is connected, because there is no, or very little, post anti-aliasing filtering done on such cards. Therefore, the outputted RGB samples need to be exactly aligned with the sampling of the AD converter.
Analogue input signals can go up to SXGA@75 Hz, which gives a pixel clock of 135 MHz. In fact, it can handle any standard with a pixel rate up to 140 MHz.
Special modes are made for the F21R E-box, for both PAL and NTSC. These are invoked when an E-box is connected to the SCAVIO panel.

Digital input:

Via the DVI connector (*Enhanced* version only) it is possible to insert TMDS (Transition Minimised Differential Signalling) data into the SCAVIO panel. DVI is a fairly new computer graphics standard, which can be seen as the digital follow-up of the analogue VGA interface. The TMDS signal is directly fed into the AD9887, where any DVI standard up to SXGA@60 Hz can be decoded to RGBHV.
The preferred VGA standard for the FM24 is programmed in the DDC EEPROM (item 7215), which can be read by the PC. Via an internal switch, it is possible to choose between the analogue input and the digital input. The output format is for both inputs the same (8 bit RGB plus HV). The driver determines whether the AD9887 outputs single or dual pixels. For lower standards like VGA@60Hz, the interface will be single pixel, which means that every clock cycle one byte of R, G, and B data is outputted. Dual pixel means that on every clock cycle two bytes of R, G, and B data outputted. These two bytes are de-multiplexed, which is done to make the interface more robust for jitter, set-up, and hold times, and to reduce the digital data rate over the PCB (reduced EMC).

Digital 'Video Path'

This path is only available in the *Enhanced* version of the SCAVIO panel and is used for the following input signals:

- CVBS input,
- Y/C input, and
- 1fH YPbPr.

It is a straightforward application of the Philips SAA7118 (item 7225) and the Micronas SDA9400 (item 7280).
The SAA7118 is a PAL/NTSC/SECAM Digital Video Decoder with adaptive digital comb filter and component video input. It decodes all input standards to 4:2:2 YCbCr, which then is processed by the SDA9400.

The SDA9400 is a motion adaptive de-interlacer, which makes a progressive video signal from the interlaced input.
Depending on the motion in the picture, it will just interleave the odd and even field (no motion: ABAB) or repeats the same field twice; this is also known as line doubling (motion: AABB). The motion detection is pixel based, with a soft-switch between 'motion' and 'no motion'.

After the de-interlacer, the signal is fed as a 4:2:2 YCbCr progressive scan signal to the video port of the PixelWorks processor.

The PixelWorks PW164 Scaler

The PixelWorks PW164 Image Processor is a highly integrated (Ball Grid Array, BGA) chip, which interfaces video inputs and computer graphics in virtually any format to the PDP.

Computer images from VGA to UXGA resolution input to the chip can be resized to fit on the PDP. Horizontal and vertical image scalers, coupled with intelligent frame locking circuitry create sharp images, centred on the screen and without user intervention. An embedded DRAM frame buffer and memory controller perform the frame rate conversion.

Video data from 4:3 aspect ratio NTSC or PAL and 16:9 aspect ratio sources such as HDTV and DVD are supported. Non-linear scaling (only with Receiver Box) and separate horizontal and vertical scalers allow these inputs to be resized optimally for the native resolution of the PDP.

For more information, see *http://www.pixelworksinc.com/index.phtml*

Table 9-3 PixelWorks Scaler: Ports

Pin	Name	I/O	Remark
C2	PW_SCL	+3V3 output	to I2C devices, Video related
B1	PW_SDA	+3V3 output	to I2C devices, Video related
A1	PW_SDA_NVM	+3V3 output	to I2C device NVM
C4	PW_SCL_NVM	+3V3 output	to I2C device NVM
B3	SCL_2	+3V3 output	to I2C device OTC
A2	SDA_2	+3V3 output	to I2C device OTC
A3	VIDEO_SEL_1	+3V3 output	to video selection switches (see truth table)
C5	VIDEO_SEL_2	+3V3 output	to video selection switches (see truth table)
B4	VGA2_OUTN	+3V3 output	Selects VGA 2 as output. (Low => Output)
A4	VGA2_EN	+3V3 output	Enables VGA 2 (High = Enable)
C6	SYNC	Input	Is 'high' if EPLD detects separate sync signals on YPbPr
B5	1_2FH	Input	Is 'high' if sync on YPbPr is 1fH (from EPLD)

Table 9-4 PixelWorks Scaler: Video Select

VIDEO_SEL_1	VIDEO_SEL_2	Selected input for AD9887
0	0	RGB 2fh
0	1	YPbPr 2fh
1	0	VGA 1
1	1	VGA 2

Service remark: Desoldering/soldering of this IC requires very specialised (BGA) equipment. This can only be done by the Authorised Service Centres (ASC).

The EPLD

The main reason to add the EPLD is the contrast reserve function. Other reasons:

- **Black and white ADC adjustment.** The EPLD provides a high-resolution measurement of the black and white level, to adjust the gain and offset of the ADC (AD9887). It is read via I^2C.
- **LVDS reset.** This function resets the LVDS transmitter on the SCAVIO board, in case the LVDS transmitter starts up without a clock. This could cause an abnormal picture. Therefore, as soon as the clock is not fast enough (as during start-up) the EPLD will keep the LVDS transmitter in reset.
- **Receiver-box mode detection.** For loop through mode (a second FTV monitor connected to the output of the first monitor), a secondary detection is needed to check the presence of an Receiver or E-box.
- **ATSC sync detection/ decoding.** Core for proper sync decoding for ATSC sources.
- **Contrast reserve.** This function can increase the gain of the video signal to a factor of two. It will reduce the gain again if it sees too many overflows (code 255) in any of the R, G, or B channels. Adjustable via two parameters: user contrast and overflow limit. Parameters are I^2C controlled.

The LVDS transmitter

This DS90C385MTD56 IC from National Semiconductors converts 28 bits of CMOS/TTL data into four LVDS (Low Voltage Differential Signalling) data streams. A PLL transmit clock is transmitted in parallel with the data streams over a fifth LVDS link. Every cycle of the clock, 28 bits of input data are sampled and transmitted. At a transmit clock frequency of 36 MHz, 24 bits of RGB data and 3 bits of display control data are transmitted per LVDS data channel. This IC operates at 3.3 V

For more information, see *http://www.national.com/*

Picture Mute

In some cases, it is necessary to mute the video output:

- In Monitor mode:
 - During switch 'on/off' of the monitor,
 - During source change,
 - During video or sync loss, or
 - By a user action (A/V-mute or mute)
 - In audio only mode (when the ICONN-box is connected).
- In TV mode:
 - During switch 'on/off' of the Monitor/Receiver box,
 - During source change in the Receiver box,
 - During video or sync loss, or
 - In audio only mode (Receiver box mutes the picture).

Most of the picture mute controls are done via the PixelWorks co-processor.

Anti Ageing

In order to prevent visible luminance differences, due to ageing of the monitor, a special algorithm is implemented. This algorithm is based on horizontal shifting of the picture in the monitor. For good understanding some terms will now first be explained:

- **Ageing:** The effect that the efficiency of a plasma cell (pixel) decreases as a function of the total time that it is illuminated. This effect occurs mostly because of phosphor ageing. As a result, the cell brightness decreases over time. An alternative name for ageing is 'burn-in'.
- **Picture shifting:** Fixed structures, like logo's, OSDs, and subtitles, will cause burn-in effects. The only way to mask this to a certain extends, is picture shifting so that the 'burn-in' effect is smeared out over a larger area, and makes it less visible.

Most of the anti-ageing controls are implemented in the PixelWorks co-processor.

Horizontal

Horizontal anti-ageing steps:

- **Step width/height,** the step width/height shall be 1 horizontal pixel width (approx. 1 mm).
- **Number of steps,** the maximum number of steps in horizontal direction shall be 9.
- **Time between steps,** the time between the steps shall be 5 minutes.

The effect of H anti-ageing is a horizontal movement (start at 0):

$$0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4$$
$$12 \leftarrow 11 \leftarrow 10 \leftarrow 9 \leftarrow 8 \leftarrow 7 \leftarrow 6 \leftarrow 5 \leftarrow$$
$$\rightarrow 13 \rightarrow 14 \rightarrow 15$$

With the following sequence:

$0 \rightarrow 1 \rightarrow 2 \rightarrow \ldots\ldots \rightarrow 14 \rightarrow 15 \rightarrow 0 \rightarrow 1 \rightarrow$ etc.

After every step, the updated value is stored in NVM and gives an indication about the direction (0...4 and 13...15 to the right and 5...12 to the left).

The horizontal anti-ageing is a process, which is basically independent of any other processes that are running in SW. This means that this process should never be reset in order to get the best anti-ageing effect. Therefore, the horizontal shift positions and directions need to be stored in NVM, so that he anti-ageing process returns to its latest position after the set has been switched off or to standby. There is only one H and

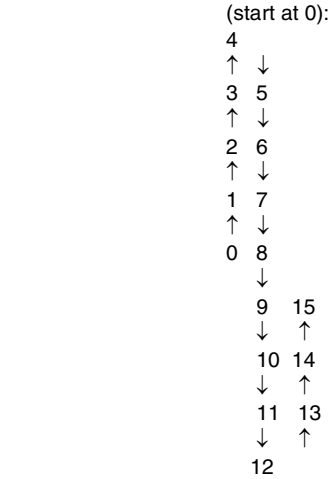
one V shift value for the anti-ageing process that is applicable for the AV1, AV2, and AV3 inputs.

Note: Horizontal shift cannot be done for sources that are screen filling and do not have sufficient overscan.

Vertical
V-shift is done in the F21RE Receiver box when the TV mode is active, or in the *enhanced* configuration when the monitor mode is active.

Vertical anti-ageing steps:
- **Height/height,** the height/height shall be 1 display line (approximately 1 mm).
- **Number of steps,** the maximum number of steps in vertical direction shall be 9.
- **Time between steps,** the time between the steps shall be 80 minutes, which equals one complete horizontal ageing shift (16 steps x 5 minutes).

The effect of V anti-ageing is a vertical movement (start at 0):



With the following sequence:
$0 \rightarrow 1 \rightarrow 2 \rightarrow \rightarrow 14 \rightarrow 15 \rightarrow 0 \rightarrow 1 \rightarrow$ etc.

After every step, the vertical shift position and its direction are stored in NVM. So the anti-ageing process returns to its last position after the set has been switched off (or to standby). Also, if by any cause (i.e. VGA-source selection or when service/factory mode is active), the anti-ageing process is stopped; the vertical shift position should be restored after resuming the anti-ageing process.

9.4.3 Audio processing (Diagrams SC13, 14 and 15)

This chapter describes the audio processing on the SCAVIO board. The circuit enables to connect several audio sources, selects the source on the desired input, and performs audio processing and audio delay. It also matches the output signals for the Audio Amplifier panel.
The sound-related electronics for FM24 are very straight forward, and consists of a Micronas MSP3415G sound processor, an active highpass and lowpass filter, and separate Class-D amplifiers for woofers and tweeters.

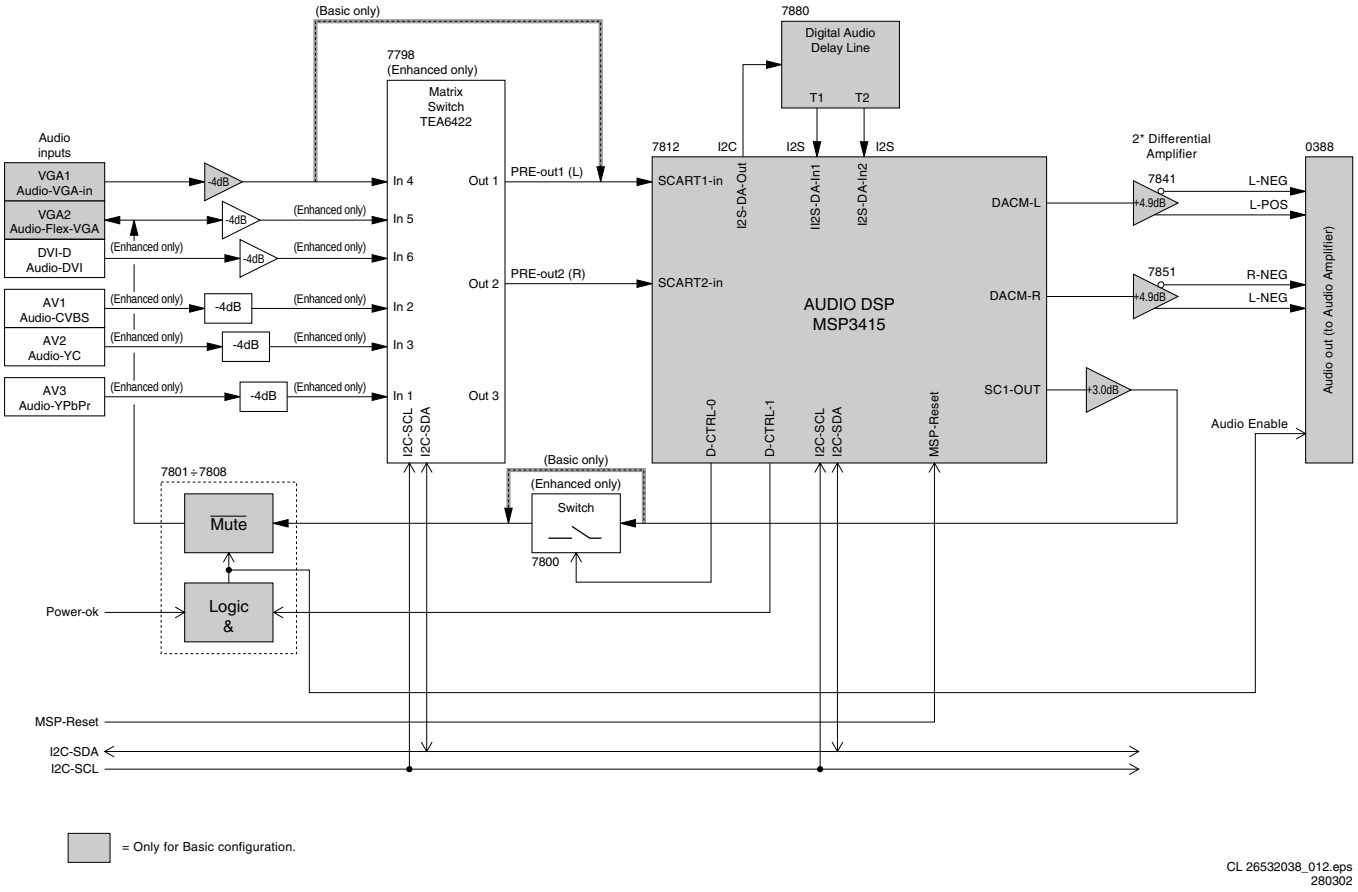


Figure 9-15 Audio Path

The processing part consists mainly of the following components:

- **MSP3415G:**
 A DSP sound processor from Micronas. This component is able to do all kinds of digital signal processing like volume, bass/treble, UltraBass and balance. It has analogue inputs and outputs, as well as an I^2S in/output used for digital audio delay.
- **RAM:**
 With its logic to be able to store the I^2S information for audio delay.
- **Anti-plop/ mute circuit:**
 Which is necessary to prevent disturbances on the audio lines during start-up or switching.
- **TEA6422:**
 A matrix switch of ST. This component is able to switch six inputs to three different outputs (only used in the *Enhanced* version).

MSP3415G

Ultra Bass
Because of the closed box implementation in FM24, a common DBE solution will not give an optimal bass performance. A closed box needs a substantial boost over a wide frequency range, while DBE operates in a limited frequency region. Adaptive Ultra Bass 2 (UB2) is a suitable alternative. This feature is based on the psycho-acoustic effect of the missing fundamental, and gives the impression of a deep bass while the loudspeakers do not reproduce these low frequencies. This feature is implemented in the MSP3415G.

Audio delay
To compensate for 'lip sync error' (the difference in time between the aural and visual perceptions), two different audio delays are selectable via the customer's menu (one for the Receiver box and one for the Monitor).
This is done at the audio processor IC7812 via an I^2S bus and an additional delay circuit (IC7880 - 7882).
One can select delays of 24 ms (I2S_DATA_IN1) and 40 ms (I2S_DATA_IN2), or no delay.
In case of a delay, the AUDIO_L/R_IN is re-routed as I2S_DATA_OUT to the audio delay circuit and, depending on the selected delay, returned as I2S_DATA_IN1 or I2S_DATA_IN2, resulting in AUDIO_L/R_OUT.

Anti-plop/Mute
In several cases, it is necessary to mute the sound output. This muting is handled by the MSP sound processor, or by the Receiver box in case of TV-mode.

- In Monitor mode:
 - During switch 'on/off' of the monitor.
 - During source change.
 - During video or sync loss, or
 - By a user action (A/V-mute or mute).
- In TV mode:
 - During switch 'on/off' of the Monitor/Receiver box.
 - During source change in the Receiver box.
 - During video or sync loss, or
 - By a user action (mute).

9.4.4 Control (Diagrams SC7, 8 and 9)

Introduction

As a main controller, the so-called ARTISTIC is used, better known as OTC (On screen display, Teletext and Control). It is a 8051 (XA) based controller from Philips Semiconductors, the SAA5801H.
Although the OTC is the main controller, it acts as a 'slave' when communicating with the PixelWorks IC via the I²C-bus 2.

When the monitor is connected to an F21RE Receiver box, the UART commands from the Receiver box will control the monitor.

In stand-alone mode, the monitor can be controlled via the Remote Control or via the RS232C port.

DDC1/2B (Display Data Channel, an I²C based protocol) is implemented with separate NVMs for the two VGA inputs and the DVI-D input as well.

It is also possible to use the RS232C port for software upload to the PW Scaler and the OTC. The target for downloading is controlled via a switch in the RS232C path; the switch itself is controlled by the OTC.

OTC Processor

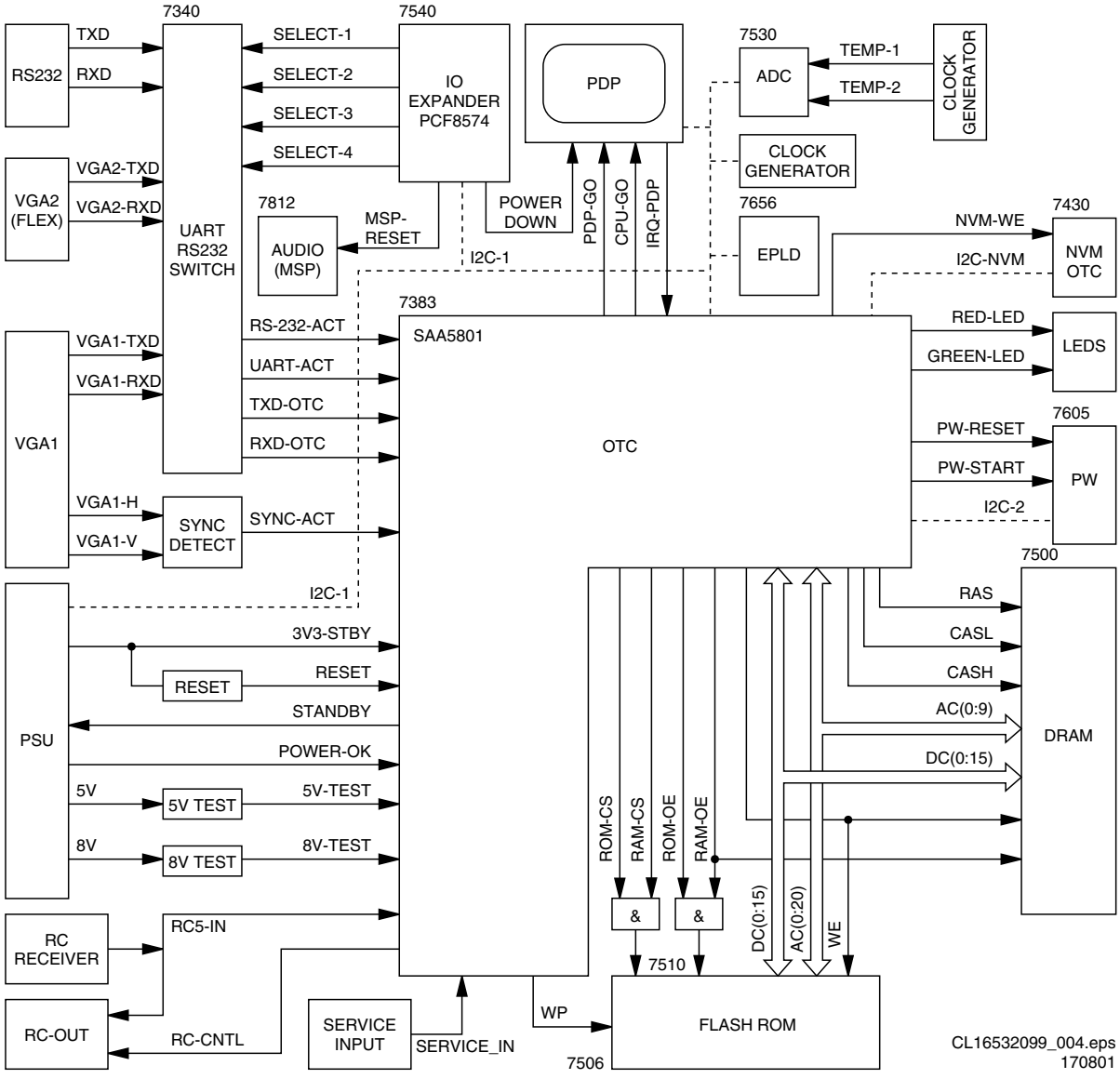


Figure 9-16 Control Part

This part describes the Main Control part of the SCAVIO panel and the interfaces with the software. The control function consists of the following tasks:

- Control of external IOs, like fan speed, temperature, service and RC5,
- UART communication with Receiver box,
- RS232 control / communication,
- Supports the uploading of new SW into the Flash-ROMs,
- Start-up of monitor and initialisation via I²C,
- Error detection and storing.

Start-up and Shut-down

The POR signal is not generated on the PSU, but on the SCAVIO board. This is done with a fully integrated ADM810T POR chip (item 7517), which senses the 3.3 V coming from the PSU. The sense level is 3.08 V. During power-up as well as power-down, this chip will make the RESET signal high. During power-up, this signal will be held 'high' until 240 ms after V_{CC} has become stable.
During power-down, the system will be reset as soon as the V_{CC} drops below 3.08 V.

Start-up from Standby

When the monitor is in standby mode, it can wake-up in several ways:

- When an RC command is received (RC_IN).
- Detection of H- and/or V-sync on VGA1.
- Detection of UART communication on VGA1.
- Detection of RS232 communication.
- Detection of Service modes.

RC Command Reception

When a RC command is received at the RC receiver on the LED panel, it will go directly to the RC input of the OTC (RC_IN on pin 100). If the monitor is in standby, and a proper RC command is send, it will wake up.
The RC commands are routed to the Receiver box via the VGA1 connector pin 9 (RC_VGA1), but this loop through connection is controlled by RC_CNTL. Below is the truth table.

Table 9-5 RC Commands overview

FTV2.1E-box	FTV2.3Monitor	RC commands	RC_CNTL
In Standby	In Standby	Send to E-box	Low
In Standby	On	Blocked	High
On	In Standby	Send to E-box	Low
On	On	Send to E-box	Low

Note: All RC commands are direct available on a separate RC-out cinch connector (RC_OUT) on the VGA connector panel.

H- and/or V-sync Detection

When both H and or V sync are present on VGA1, there is a pulse (low) on SYNC_ACT. When only H is present, SYNC_ACT is continuously low. The SW disables the interrupt, once an interrupt is received.

UART Communication Detection

When there is UART communication on VGA1, the UART detection circuitry generates on every falling edge a pulse on UART_ACT. This is a negative going pulse with a width of ± 470 s. The first pulse will trigger the main software to check for the FTV System Protocol (FSP). The SW disables the interrupt, once an interrupt is received.

RS232 Communication Detection

When an RS232 connection is made, and communication is started (pulses on RS232_RXD), RS232_ACT becomes 'high'. Via a transistor, RS232_ACT will make SERVICE_IN low. When the Monitor is operating (+5 V available), this signal is made low (in fact it is disabled).

Service Mode Detection

It is possible to enter four different Service Modes (provided the OTC is still supplied by the +3V3_STBY).
Via the SERVICE_IN signal, which is an ADC input of the OTC, a voltage drop is detected from +3.3 V to VX.
VX is a DC voltage, which represents the mode to be entered:

Table 9-6 Service Mode levels

Service mode	Limits Vx [V]	Vx [V]	Remarks
SDM	3.0 > Vx > 2.4	± 2.6	0382-2 to GND
SAM	2.4 > Vx > 1.8	± 2.0	0382-4 to GND
COMPAIR	1.8 > Vx > 1.2	± 1.4	0382-6 to GND
RS232 active	Vx < 0.8	>0.8	Plug in RS232, start program

I²C

There are four I²C busses used in the monitor (see also I²C overview in chapter 6):

- **I²C bus 1** is a (5 V) device bus, controlled by the OTC, and connected to the following devices:
 - PDP.
 - EPLD.
 - IO expander SCAVIO - PCF8574A.
 - IO expander PSU - PCF8574A.
 - ADC - PCF8591.
 - Clock generator for PW - FS6377.
 - Sound processor MSP3415G.
 - Audio switch TEA6422 (*Enhanced* version only).
- **I²C bus 2** is used for communication with the PixelWorks co-processor (PW). Although the OTC is the main controller, it will act in this case as a 'slave', since the PW can only act as a 'master'. Before any I²C commands are exchanged, the PW gets an interrupt (PW_START) to indicate that the OTC wants to talk to the PW.
- **I²C bus 3** is a (5 V) device bus, controlled by the PW, and connected to the following devices:
 - Video Decoder SAA7118 (*Enhanced* version only).
 - De-interlacer SDA9400 (*Enhanced* version only).
 - ADC/TMDS receiver AD9887.
 - 3D Comb filter MN8783LSI (optional).
- **I²C bus 4** is a (5 V) device bus, only connected to the NVM (to avoid data corruption).

Notes:

- The PDP and EPLD are in fact 3.3 V bus devices, but they need to be connected to bus 1, since the OTC is the first controller to be fully operating at start-up. For this reason, an I²C level shifter (items 7675/76 on diagram SC12) is included, which converts the 5 V signals into 3V3 and visa versa.
- One of the first commands is to set the clock generator (item7570), else the PW can not start-up.

RS232/UART

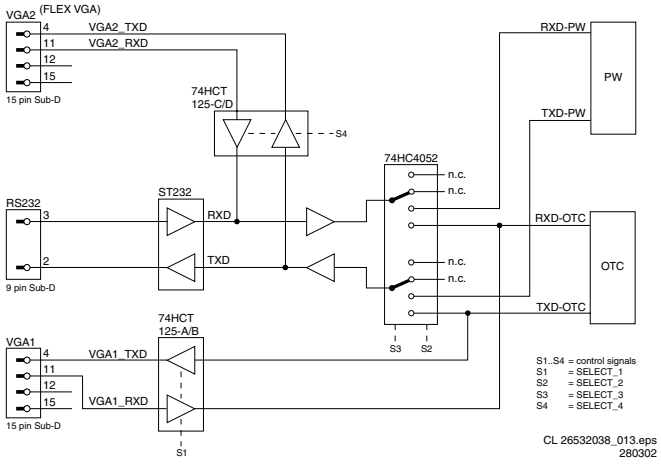


Figure 9-17 RS232/UART

Introduction
The FM24 monitor is equipped with an RS232 interface. Via a 9 pin Sub-D connector, it is possible to connect a PC for special modes like:
- SW download.
- Factory purposes.
- Service.
- Professional use.

A second option is the connection of a so-called ICONN-box for Institutional TV (Hotel TV).

For communication with the Receiver Box, UART is used, because this protocol can handle longer cable distances than I^2C. The (Receiver box) UART is interfaced via a 15 pin Sub-D connector (VGA connector). Via this UART connection, the F21RE Receiver box and the FM24 Monitor can communicate (via FSP). By doing so, the monitor will know that there is an Receiver box connected and thus it is operating as a TV configuration.

RS232/UART Control
The OTC (SELECT_1 to 4) controls the RS232/UART switches. When the monitor is in Receiver box mode, there is no RS232 communication possible. The monitor is default set in Receiver box mode (switch to n.c. position) and the UART from/to VGA1 is enabled, to allow communication with Receiver box.
If no Receiver box is detected, the UART is disabled to ensure that there will be no communication towards the OTC, and the switch is set to OTC. Below the truth table of the switches is shown, which determine the TXD/RXD path.

Table 9-7 RS232/UART Control

S1= SELECT_1 (P0)	S2 = SELECT_1 (P1)	S3 = SELECT_1 (P3) (3)	S4 = SELECT_4 (P4) (4)		UART VGA1 (E-box)	UART VGA2 (flex)	RS232 set to OTC (1)	RS232 set to PW (2)
0	0	0	0		0	0	0	0
0	0	0	1		0	0	0	0
0	0	1	0		0	0	0	0
0	0	1	1		1	0	0	0
0	1	0	0		0	0	0	0
0	1	0	1		0	0	0	0
0	1	1	0		0	0	0	0
0	1	1	1		1	0	0	0
1	0	0	0		0	0	0	0
1	0	0	1		0	0	1	0
1	0	1	0		0	1	0	0
1	0	1	1		0	0	0	0
1	1	0	0		0	0	0	0
1	1	0	1		0	0	0	1
1	1	1	0		0	1	0	0
1	1	1	1		0	0	0	0

(1) Software download or ComPair mode.
(2) Software download or Debug mode.
(3) When S3 = 1 the 74HCT4052 is in a tri-state ('off' state).
(4) When S4 = 0 the TXD out of RS232 is disabled (S4 may not become low in any other case).

UART Detection
When the VGA1_RXD line is continuously 'low', the OTC might run slow due the fact that so-called 'break' signals are generated. To prevent this, a small circuitry is added to detect whether VGA1_RXD is continuously 'low' (item 7310).
When the VGA1_RXD line is 'low' for about 20 ms, the buffer-switch (item 7303-A) is opened. After this buffer, a second discrete buffer is placed (items 7315/16), which keeps the RXD_OTC line 'high' and changes the 5 V into a 3.3 V level.

ICONN-box
For application of a Flat TV in a hotel environment, the monitor is designed to operate with a so-called ICONN-Box. The ICONN-box will take over the user control of the monitor, by intercepting the RC5-commands coming from a dedicated RC-transmitter, which sends specific hotel-mode commands and sending its own RC-commands to the microprocessor in the monitor.
So in the ICONN-Box, the hotel-mode commands will be converted to RC5-commands, which than can be interpreted by the monitor.
When connected to the RS232 input, this box takes over the control of the IR-receiver in the monitor. It is also able to control the front LED. The switches (7550 for the IR and 7555 for the LED signals) are controlled by the ICONN_NOT signal.

The ICONN-Box shall interface the Monitor with the following signals:
- **IR-RX.** These are the RC5-commands coming from the specific hotel RC5 - transmitter, which are received via the RC5-receiver of the monitor.
- **IR-TX.** These are the RC5-commands generated by the ICONN-Box and send to the monitor.
- **RL-ICN.** Control signal from the microprocessor (of the monitor), indicating the power state of the monitor. The ICONN-Box and monitor LED are driven in parallel.
- **GL-ICN.** Control signal from the microprocessor (of the monitor), indicating the functionality of the monitor, to drive the LED on the ICONN-Box.
- **LD-ICN.** Control signal from the ICONN-Box to drive the green LED on the monitor.

9.5 Audio Amplifier Panel (Diagram A)

9.5.1 Introduction

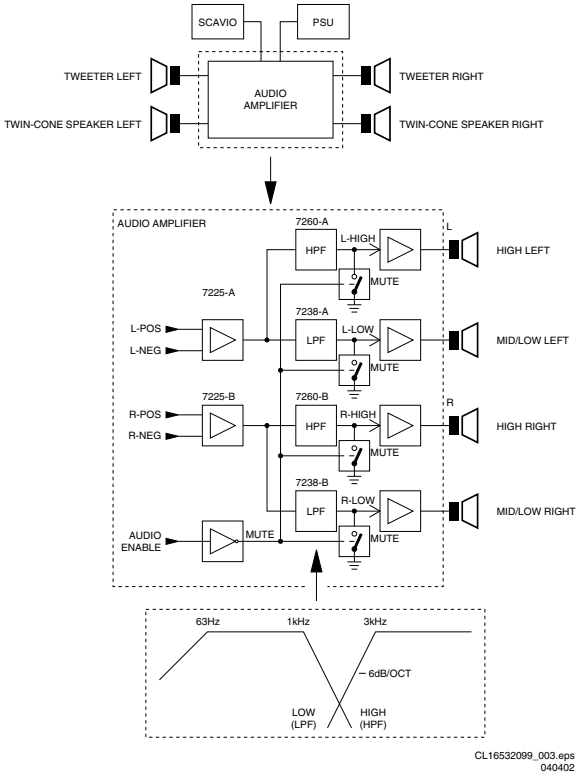


Figure 9-18 Blockdiagram Audio Amplifier

This panel houses the audio filters and amplifiers necessary for driving the speakers. The differential audio inputs (for common mode immunity) come from the SCAVIO panel (via connector 0388).
The PSU delivers the positive and negative supply voltage of 14.5 V_{DC}, as well as the +9V_STBY voltage.
After being filtered and amplified, the signals go to the speaker section, where the (twin cone) low/mid range speakers and the tweeters are driven (load impedance is 8 Ω).

9.5.2 Supply (Diagram A7)

The supply voltage is a symmetrical voltage of +/- 14.5 V_{DC}, generated by the main supply via L5002.

- V_{SND_POS} (+14.5 V_{DC}) on connector 0302 pin 5/6, and
- V_{SND_NEG} (-14.5 V_{DC}) on connector 0302 pin 1/2.

9.5.3 Filter (Diagram A2)

Electrical filtering is needed for following reasons:

- Limiting the cone excursion, thereby reducing the distortion.
- Increasing the power handling capacity (PHC).

In the FM24, active second order Sallen-Key filters are used, with crossover frequencies of 1 kHz for the lowpass filter, and 3 kHz for the highpass filter.

The audio signals are filtered **before** the amplifier. There are some reasons for doing this:

- It is now easy to do active filtering, and
- At less costs (no expensive coils and capacitors).

Low Pass Filter (LPF)
For L and R separately, a Low Pass Filter (IC7238A and B) is processing L_LOW and R_LOW.
The output signal of this filter is then fed to the audio amplifier (identical for right channel).

High Pass Filter (HPF)
For L and R separately, a High Pass Filter (IC7260A and B) is processing L_HIGH and R_HIGH.
The output signal of this filter is then fed to the audio amplifier (identical for right channel).

9.5.4 Amplifier (Diagrams A3 to A6)

Each speaker has its' own 15 W class-D amplifier. These amplifiers combine a good performance with a high efficiency, resulting in a big reduction in heat generation.

Principle
Audio-power-amplifier systems have traditionally used linear amplifiers, which are well known for being inefficient. In fact, a linear Class AB amplifier is designed to act as a variable resistor network between the power supply and the load. The transistors operate in their linear region, and the voltage that is dropped across the transistors (in their role as variable resistors) is lost as heat, particularly in the output transistors. Class D amplifiers were developed as a way to increase the efficiency of audio-power-amplifier systems.

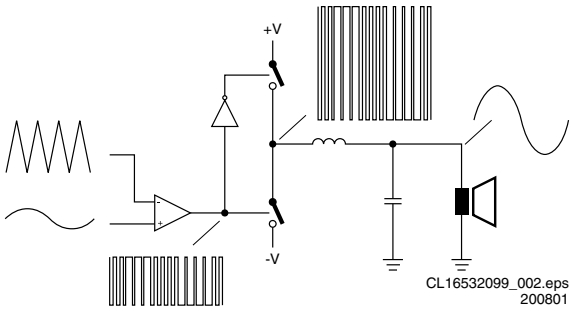


Figure 9-19 Principle Class-D Amplifier

The Class D amplifier works by varying the duty cycle of a Pulse Width Modulated (PWM) signal.
By comparing the input voltage to a triangle wave, the amplifier increases duty cycle to increase output voltage, and decreases duty cycle to decrease output voltage.
The output transistors (item 7365 on diagram A3) of a Class D amplifier switch from 'full off' to 'full on' (saturated) and then back again, spending very little time in the linear region in between. Therefore, very little power is lost to heat. If the transistors have a low 'on' resistance ($R_{DS(ON)}$), little voltage is dropped across them, further reducing losses.
A Low Pass Filter at the output passes only the average of the output wave, which is an amplified version of the input signal.
In order to keep the distortion low, negative feedback is applied (via R3308). A second feedback loop (via R3310) is tapped after the output filter, in order to decrease the distortion at high frequencies.

The **advantage** of Class D is increased efficiency (= less heat dissipation). Class D amplifiers can drive the same output power as a Class AB amplifier using less supply current.
The **disadvantag**e is the large output filter that drives up cost and size. The main reason for this filter is that the switching waveform results in maximum current flow. This causes more loss in the load, which causes lower efficiency. An LC filter with a cut-off frequency less than the Class D switching frequency (350 kHz), allows the switching current to flow through the filter instead of the load. The filter is less lossy than the speaker, which causes less power dissipated at high output power and increases efficiency in most cases.

9.5.5 Mute (Diagram A2 to A6)

A mute switch (item 7302) is provided at the PWM inputs (item 7315, LM311). This switch is controlled by the AUDIO_ENABLE line, which checks the availability of the +9V_STBY voltage.

9.5.6 Protections

Short-circuit Protection (Diagram A3)
A protection is made against a too high temperature of transistor 7355 in case of a short-circuit of output FET 7365-1. Transistor 7340 is sensing the current through transistor 7355 via R3355, and activates the DC-protection line (see below) in case the current becomes too high. This is the same for all four amplifier parts.

DC-protection (Diagram A7)

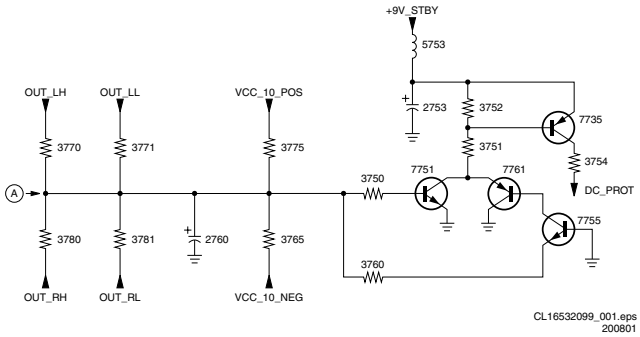


Figure 9-20 DC Protection

Because of the symmetrical supply, a DC-blocking capacitor, between the amplifier and the speaker, is not necessary. However, it is still necessary to protect the speaker for DC voltages.
The following protections are therefore implemented:
- Via R3765 and R3775, each stabilised supply voltage line (via items 7735 and 7745) is checked on deviations.
- Via R3770/3771/3780/3781, each amplifier output is checked for DC-voltage.

Via R3765/3775, a virtual earth is imposed on point A. When one of the supply voltages deviates, a DC voltage will occur on this point. If point A is positive, T7751 will conduct. If it is negative, T7761 will conduct.
Both cases will make T7735 conduct, so that the DC-PROT signal will be made high. This ensures that the power supply is rapidly trimmed back.
Capacitor C2760 will ensure that only DC-signals at point A will activate the protection.

9.6 LED/Switch Panel (Diagram LD)

This panel contains:
- The red and green status LEDs,
- The RC input receiver,
- The light sensor, and
- The 'on/off' switch.

All signals on this panel come directly from the SCAVIO panel:
- The LED and sensor signals (RED_LED, GREEN_LED and LIGHT_SEN_IN) are routed to the OTC. When a F21RE Receiver box is connected, the sensor signal is routed to the OTC of this box (via UART), where it will control the HOP via I^2C.
- The RC signal (RC_IN) is routed to the OTC, the VGA1 connector, and the RC-out cinch connector.
- The signals to (+9V_STBY) and from (+9V_STBY_SW) the 'on'/'off' switch are routed to the PSU board.

9.7 Plasma Display Panel (PDP)

9.7.1 General

The PDP, which is used in the FM24, is a product of Fujitsu Hitachi Plasma Display Ltd (FHP). When defect, a new panel must be ordered, and after receipt, the defective panel must be send for repair in the packing (flight case) of the new ordered panel.

9.7.2 Operation

Principle
Plasma displays work by applying a voltage between two transparent display electrodes on the front glass plate of the display. The electrodes are separated by an MgO dielectric layer and surrounded by a mixture of neon and xenon gases. When the voltage reaches the 'firing level', a plasma discharge occurs on the surface of the dielectric, resulting in the emission of ultra violet light.
This UV light then excites the phosphor material at the back of the cell and emits visible light. Each cell or sub-pixel has red, blue or green phosphor material and three sub-pixels combine to make up a pixel. The intensity of each colour is controlled by varying the number and width of voltage pulses applied to the sub-pixel during a picture frame. This is implemented by dividing each picture frame into sub-frames. During a sub-frame, all cells are first addressed - those to be lit are pre-charged to a specific address voltage - then during the display time the display voltage is applied to the entire screen lighting those that were addressed.
Each sub-frame has a weighting ranging from 1 time unit to 128 time units for a typical eight sub-frame arrangement (Time Unit depends on size and number of pixels on the screen). This is a purely digital PWM control mechanism, which is a key advantage as it eliminates any unnecessary digital to analogue conversions, making the PDP technology ideal for the all-digital age.

Achieving High Resolution
While conventional technology, as found in standard VGA resolution screens, uses 2 display electrodes for each horizontal line, applying the same method to achieve higher resolution (>1000 horizontal lines) brings inherent problems. Firstly, the number of electrodes would need to be doubled which would require very high precision production processes. Secondly, the cell aperture ratio would reduce resulting in lower brightness. In addition, either the driving scheme would have to operate with double the speed, again introducing significantly higher cost, or a dual-scan technique would have to be introduced. With dual-scan, twice as many driving ICs would be required. In summary, implementing high resolution with conventional technology would result in lower brightness and increased costs.

ALiS Technology
To achieve high brightness as well as cost-effectiveness, FHP developed ALiS (Alternate Lighting of Surfaces) Technology. ALiS is based on 3 principles:
- Odd and Even lines are displayed separately
- The non-lighting area between the cells is utilised
- The number of electrodes = the number of horizontal display lines + 1

Despite the smaller cell size, the aperture ratio can be increased from 40% to 65% meaning that the screen is inherently brighter. Another spin-off benefit is that the lighting duty is reduced to 50% (odd fields and even fields lit for half of each frame) meaning that a significantly improved phosphor lifetime can be expected.

For more information, see *http://www.fme.fujitsu.com/products/plasma/01.html*

9.8 Abbreviation list

ADC	Analogue to Digital Converter
ALiS	Alternate Lighting of Surfaces, new plasma display technology
AM	Amplitude Modulation
AP	Asia Pacific
AV	External Audio Video
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BGA	Ball Grid Array
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries
ComPair	Computer aided rePair
CVBS	Composite Video Blanking and Synchronisation
DAC	Digital to Analogue Converter
DDC	Display Data Channel (a protocol based on I2C)
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
DFU	Direction For Use: description for the end user
DNR	Dynamic Noise Reduction
DRAM	Dynamic RAM
DSP	Digital Signal Processing
DTS	Digital Theatre Sound
DVD	Digital Versatile Disc
DVI-d	Digital Visual Interface, d = digital only
EEPROM	Electrically Erasable and Programmable Read Only Memory
EMI	Electro Magnetic Interference
EPLD	Erasable Programmable Logic Device
EU	Europe
EXT	External (source), entering the set via SCART or Cinch
FLASH	Flash memory
FM	Frequency Modulation
FSP	FTV System Protocol
FTV	Flat TeleVision
HP	Headphone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz
I^2C	Integrated IC bus
I^2S	Integrated IC Sound bus
ICONN	Institutional CONNector
IF	Intermediate Frequency
Interlaced	Scan mode where two fields are used to form one frame. Each field contains half the number of the total amount of lines. The fields are written in 'pairs', causing line flicker.
IR	Infra Red
IRQ	Interrupt Request
LATAM	Latin America
LED	Light Emitting Diode
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LS	Loudspeaker
LVDS	Low Voltage Differential Signalling
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
MOSFET	Metal Oxide Silicon Field Effect Transistor, switching device
MPEG	Motion Pictures Experts Group
NC	Not Connected
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.
NTC	Negative Temperature Coefficient, non-linear resistor
NTSC	National Television Standard Committee. Colour system mainly used in North America and Japan. Colour carrier NTSC M/N = 3.579545 MHz, NTSC 4.43 = 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
NVM	Non Volatile Memory: IC containing TV related data e.g. alignments
OC	Open Circuit
OSD	On Screen Display
OTC	On screen display, Teletext and Control
P50	Project 50 or Easy Link
PAL	Phase Alternating Line. Colour system mainly used in West Europe (colour carrier = 4.433619 MHz) and South America (colour carrier PAL M = 3.575612 MHz and PAL N = 3.582056 MHz)
PCB	Printed Circuit Board
PCM	Pulse Code Modulation
PDP	Plasma Display Panel
PFC	Power Factor Corrector (or Pre-conditioner)
PIP	Picture In Picture
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency
POR	Power On Reset, signal to reset the P
Progressive Scan	Scan mode, where all scan lines are displayed in one frame at the same time, creating a double vertical resolution.
PTC	Positive Temperature Coefficient, non linear resistor
PW	Pixel Works (manufacturer) video scaling co-processor
PWM	Pulse Width Modulation
RAM	Random Access Memory
RC	Remote Control handset
RC5	Remote Control system 5, signal from the remote control receiver
RGB	Red Green Blue
ROM	Read Only Memory
SCART	Syndicat des Constructeurs d'Appareils Radiorecepteurs et Televisieurs
SCAVIO	Scaler Control Audio Video Input and Output
SCL	Serial Clock I2C
SDA	Serial Data I2C
SDRAM	Synchronous DRAM
SECAM	SEequence Couleur Avec Memoire. Colour system mainly used in France and East Europe. Colour carriers = 4.406250 MHz and 4.250000 MHz
SMPS	Switched Mode Power Supply
SOG	Sync On Green
SOPS	Self Oscillating Power Supply
S/PDIF	Sony Philips Digital InterFace
SRAM	Static RAM
STBY	Standby
SVHS	Super Video Home System
SW	Software
SXGA	1280x1024
THD	Total Harmonic Distortion
TMDS	Transition Minimised Differential Signalling
TXT	Teletext
UART	Universal Asynchronous Receiver Transmitter, 2-wire bus which can handle longer cables than I2C.

P	Microprocessor
VCR	Video Cassette Recorder
Va	Addressing voltage for the plasma display
Vra	Setting voltage for Va
Vrs	Setting voltage for Vs
Vs	Sustain voltage for the plasma display
Y/C	Luminance (Y) and Chrominance (C) signal
YUV	Component video
0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16:9 format, 12 = play 4:3 format

9.9 IC Data

In this paragraph, the internal block diagrams and pinning are given of ICs that are drawn as a 'black box' in the electrical diagrams (with exception of 'memory' and 'logic' ICs).

9.9.1 Diagram P2, TNY256 (IC7500)

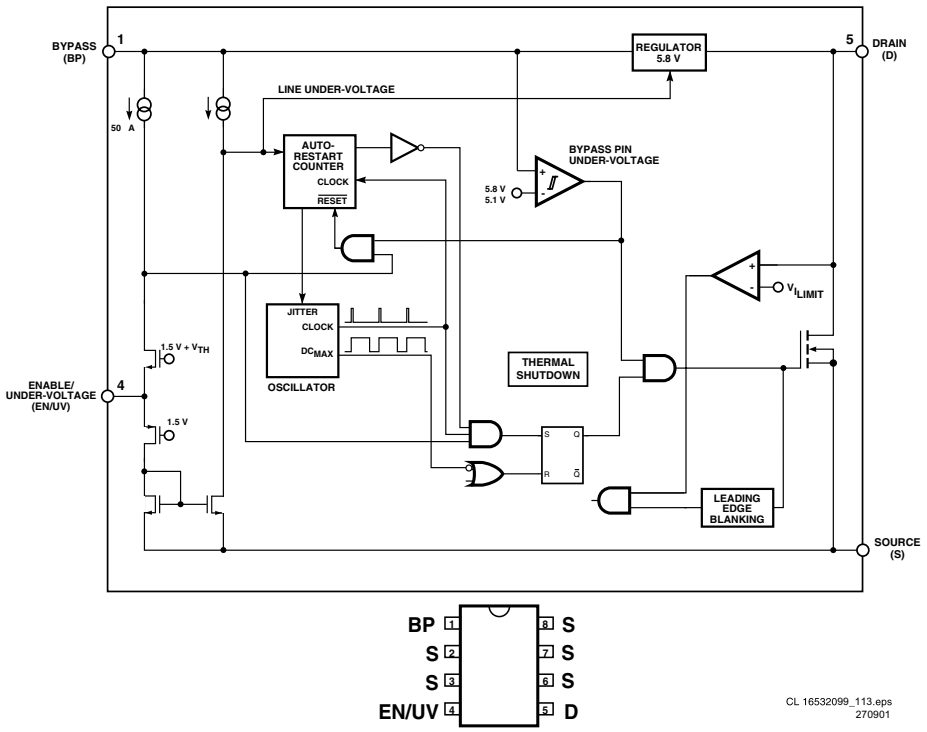


Figure 9-21 Internal Block Diagram and pinning TNY256

9.9.2 Diagram P5, MC33368 (IC7650)

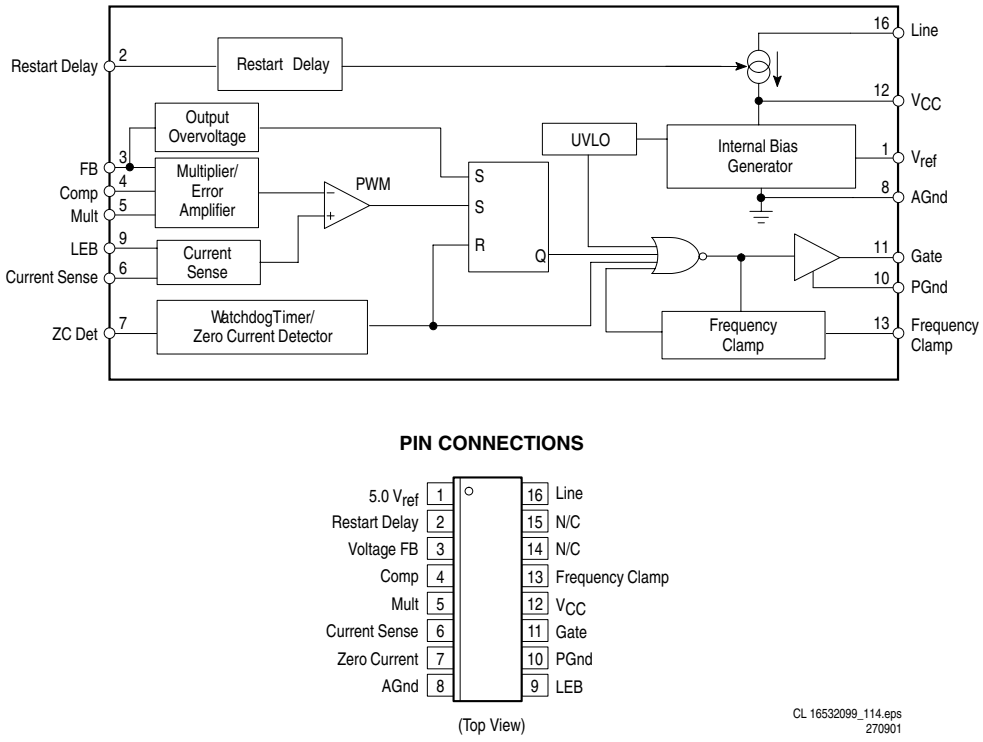


Figure 9-22 Internal Block Diagram and pinning MC33368

9.9.3 Diagram P7, TEA1507 (IC7112 and IC7212)

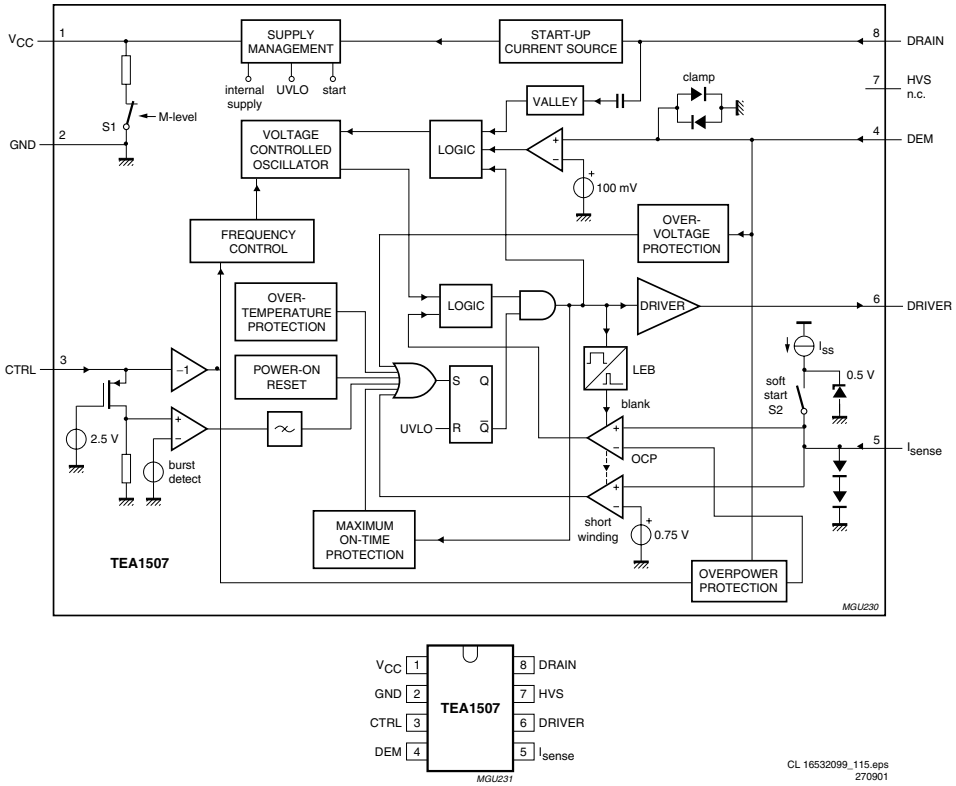


Figure 9-23 Internal Block Diagram and pinning TEA1507

9.9.4 Diagram P7, L4973V (IC7260)

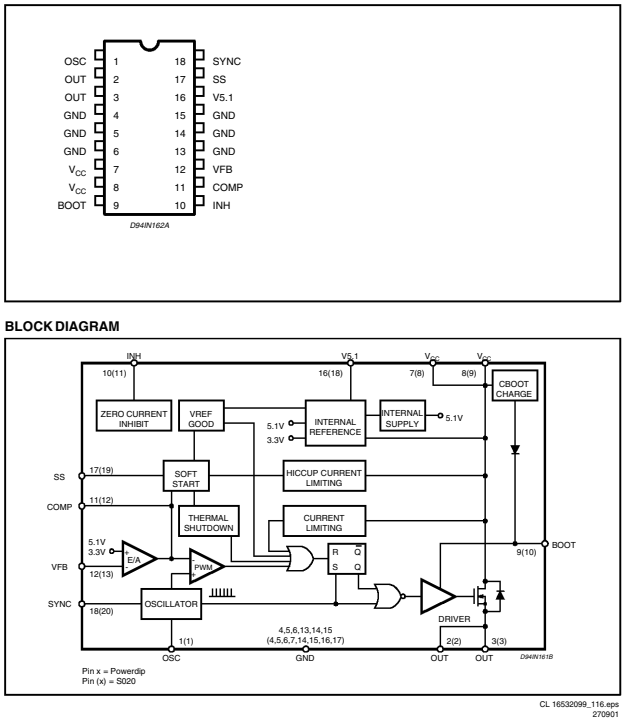


Figure 9-24 Internal Block Diagram and pinning L4973

9.9.5 Diagram SC2, LM1881M (7040)

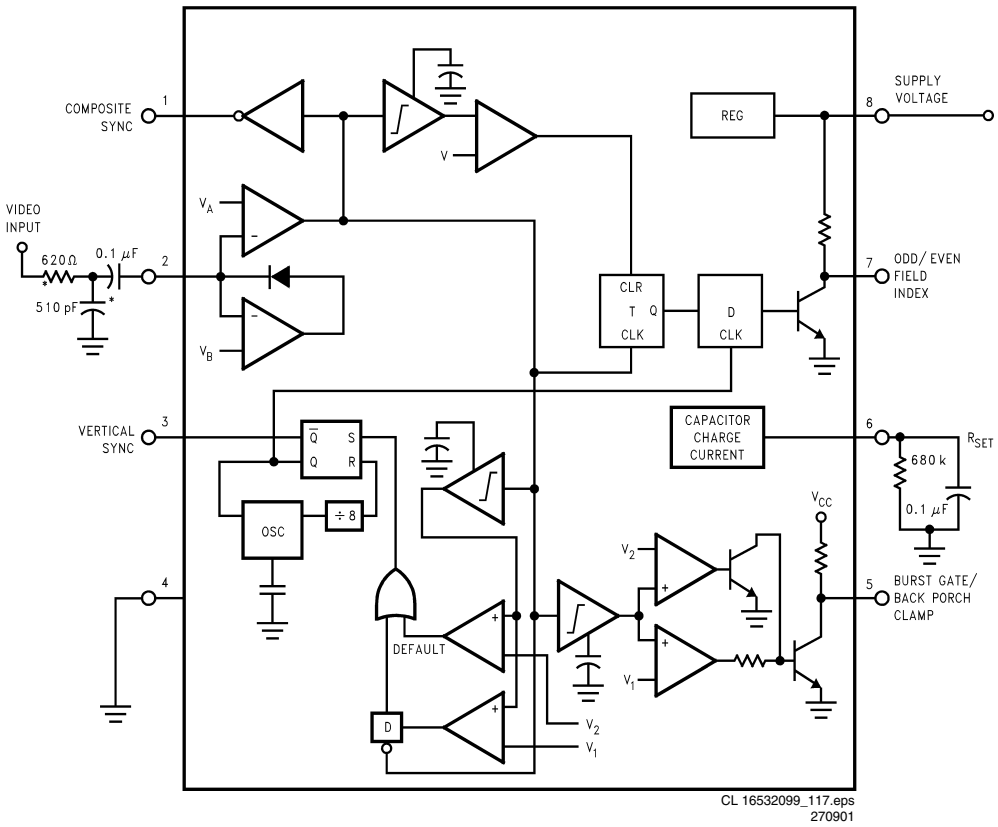


Figure 9-25 Internal Block Diagram and pinning LM1881

9.9.6 Diagram SP2, PCF8591 (7530)

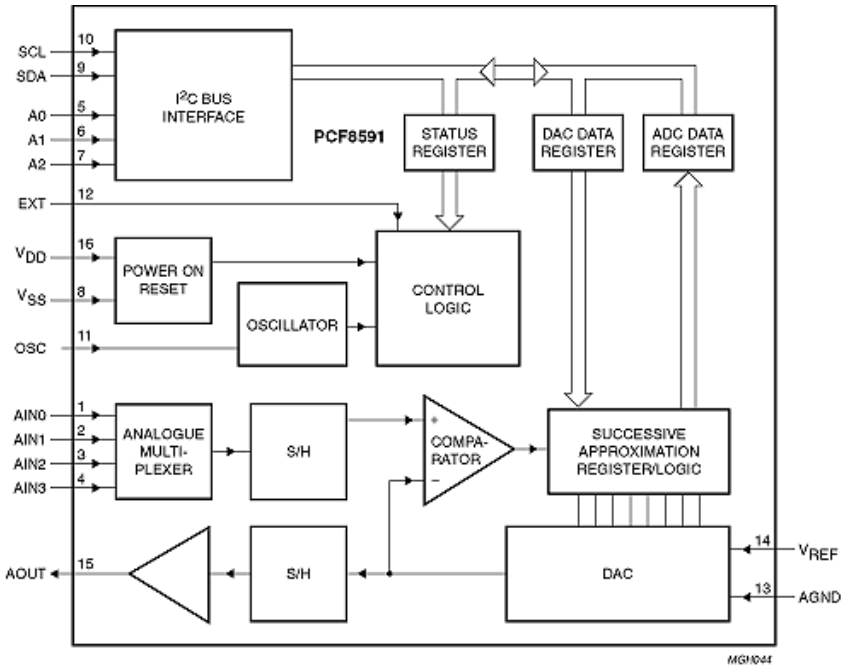


Figure 9-26 Internal Block Diagram PCF8591

10. Spare Parts List

Audio Amplifier [A]

Various

0302	2422 025 16846	9P male hor
0303	2422 025 16702	5P male hor
0304	2422 025 16543	4P male hor
0388	2422 025 16704	8P male hor
1730	4822 071 52502	Fuse 2.5A
1740	4822 071 52502	Fuse 2.5A

⊣⊢

2201	4822 126 13193	4.7nF 10% 63V
2202	4822 124 23002	10µF 16V
2204	4822 126 14226	82pF 5% 50V 0603
2205	4822 126 13193	4.7nF 10% 63V
2206	4822 124 23002	10µF 16V
2207	4822 126 14226	82pF 5% 50V 0603
2212	5322 126 11578	1nF 10% 50V 0603
2215	4822 126 13193	4.7nF 10% 63V
2216	4822 124 23002	10µF 16V
2218	4822 126 14226	82pF 5% 50V 0603
2220	4822 126 13193	4.7nF 10% 63V
2221	4822 124 23002	10µF 16V
2222	4822 126 14226	82pF 5% 50V 0603
2224	2238 586 59812	100nF 10% 16V 0603
2225	2238 586 59812	100nF 10% 16V 0603
2233	2020 552 96325	68nF 10% 25V
2234	2238 586 59812	100nF 10% 16V 0603
2238	2238 586 59812	100nF 10% 16V 0603
2239	2238 586 59812	100nF 10% 16V 0603
2243	2020 552 96325	68nF 10% 25V
2244	2238 586 59812	100nF 10% 16V 0603
2255	4822 126 14494	22nF 10% 25V 0603
2256	4822 126 14494	22nF 10% 25V 0603
2260	2238 586 59812	100nF 10% 16V 0603
2261	2238 586 59812	100nF 10% 16V 0603
2270	4822 126 14494	22nF 10% 25V 0603
2271	4822 126 14494	22nF 10% 25V 0603
2309	4822 126 14247	1.5nF 50V 0603
2310	4822 126 14226	82pF 5% 50V 0603
2315	4822 124 12084	1µF 20% 50V
2316	2238 586 59812	100nF 10% 16V 0603
2318	2238 586 59812	100nF 10% 16V 0603
2319	4822 124 12084	1µF 20% 50V
2330	2238 586 59812	100nF 10% 16V 0603
2334	2020 012 93764	220µF 20% 35V
2335	2238 586 59812	100nF 10% 16V 0603
2340	5322 126 11583	10nF 10% 50V 0603
2355	2238 586 59812	100nF 10% 16V 0603
2359	2238 586 59812	100nF 10% 16V 0603
2360	2020 012 93764	220µF 20% 35V
2365	2020 552 96326	220nF 10% 16V
2366	2020 552 96326	220nF 10% 16V
2409	4822 126 14247	1.5nF 50V 0603
2410	4822 126 14226	82pF 5% 50V 0603
2415	4822 124 12084	1µF 20% 50V
2416	2238 586 59812	100nF 10% 16V 0603
2418	2238 586 59812	100nF 10% 16V 0603
2419	4822 124 12084	1µF 20% 50V
2430	2238 586 59812	100nF 10% 16V 0603
2434	2020 012 93764	220µF 20% 35V
2435	2238 586 59812	100nF 10% 16V 0603
2440	5322 126 11583	10nF 10% 50V 0603
2455	2238 586 59812	100nF 10% 16V 0603
2459	2238 586 59812	100nF 10% 16V 0603
2460	2020 012 93764	220µF 20% 35V
2465	2020 552 96326	220nF 10% 16V
2466	2020 552 96326	220nF 10% 16V
2509	4822 126 14247	1.5nF 50V 0603
2510	4822 126 14226	82pF 5% 50V 0603
2515	4822 124 12084	1µF 20% 50V
2516	2238 586 59812	100nF 10% 16V 0603
2518	2238 586 59812	100nF 10% 16V 0603
2519	4822 124 12084	1µF 20% 50V
2530	2238 586 59812	100nF 10% 16V 0603
2534	2020 012 93764	220µF 20% 35V
2535	2238 586 59812	100nF 10% 16V 0603
2540	5322 126 11583	10nF 10% 50V 0603
2555	2238 586 59812	100nF 10% 16V 0603
2559	2238 586 59812	100nF 10% 16V 0603
2560	2020 012 93764	220µF 20% 35V
2565	2020 552 96326	220nF 10% 16V
2566	2020 552 96326	220nF 10% 16V
2609	4822 126 14247	1.5nF 50V 0603
2610	4822 126 14226	82pF 5% 50V 0603
2615	4822 124 12084	1µF 20% 50V
2616	2238 586 59812	100nF 10% 16V 0603
2618	2238 586 59812	100nF 10% 16V 0603
2619	4822 124 12084	1µF 20% 50V
2630	2238 586 59812	100nF 10% 16V 0603
2634	2020 012 93764	220µF 20% 35V
2635	2238 586 59812	100nF 10% 16V 0603
2640	5322 126 11583	10nF 10% 50V 0603
2655	2238 586 59812	100nF 10% 16V 0603
2659	2238 586 59812	100nF 10% 16V 0603
2660	2020 012 93764	220µF 20% 35V
2665	2020 552 96326	220nF 10% 16V
2666	2020 552 96326	220nF 10% 16V
2730	2020 012 93764	220µF 20% 35V
2732	2020 012 93764	220µF 20% 35V
2734	4822 124 12084	1µF 20% 50V
2740	2020 012 93764	220µF 20% 35V
2742	2020 012 93764	220µF 20% 35V
2744	4822 124 12084	1µF 20% 50V
2752	4822 124 23002	10µF 16V
2753	4822 124 23002	10µF 16V
2759	5322 126 11578	1nF 10% 50V 0603
2760	5322 124 41945	22µF 20% 35V
2770	5322 126 11578	1nF 10% 50V 0603
2771	5322 126 11578	1nF 10% 50V 0603
2780	5322 126 11578	1nF 10% 50V 0603
2781	5322 126 11578	1nF 10% 50V 0603
2799	5322 126 11583	10nF 10% 50V 0603

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3201	4822 051 30221	220Ω 5% 0.062W
3202	4822 051 30102	1k 5% 0.062W
3203	4822 051 30272	2k7 5% 0.062W
3205	4822 051 30221	220Ω 5% 0.062W
3206	4822 051 30102	1k 5% 0.062W
3207	4822 051 30272	2k7 5% 0.062W
3210	4822 051 30333	33k 5% 0.062W
3211	4822 117 13632	100k 1% 0.62W 0603
3215	4822 051 30221	220Ω 5% 0.062W
3216	4822 051 30102	1k 5% 0.062W
3217	4822 051 30272	2k7 5% 0.062W
3220	4822 051 30221	220Ω 5% 0.062W
3221	4822 051 30102	1k 5% 0.062W
3222	4822 051 30272	2k7 5% 0.062W
3230	4822 051 30101	100Ω 5% 0.062W
3231	4822 051 30222	2k2 5% 0.062W
3232	4822 051 30152	1k5 5% 0.062W
3233	4822 051 30222	2k2 5% 0.062W
3234	4822 051 30561	560Ω 5% 0.062W
3240	4822 051 30101	100Ω 5% 0.062W
3241	4822 051 30222	2k2 5% 0.062W
3242	4822 051 30152	1k5 5% 0.062W
3243	4822 051 30222	2k2 5% 0.062W
3244	4822 051 30561	560Ω 5% 0.062W
3255	4822 117 11817	1k2 1% 1/16W
3256	4822 051 30332	3k3 5% 0.062W
3257	4822 051 30471	470Ω 5% 0.062W
3259	4822 117 12917	1Ω 5% 0.062W 0603
3270	4822 117 11817	1k2 1% 0.062W
3271	4822 051 30332	3k3 5% 0.062W
3272	4822 051 30471	470Ω 5% 0.062W
3274	4822 117 12917	1Ω 5% 0.062W 0603
3301	4822 051 30102	1k 5% 0.062W
3302	4822 051 30472	4k7 5% 0.062W
3303	4822 051 30102	1k 5% 0.062W
3304	4822 051 30472	4k7 5% 0.062W
3306	4822 117 12902	8k2 1% 0.063W 0603
3307	4822 117 13632	100k 1% 0.62W 0603
3308	4822 117 13632	100k 1% 0.62W 0603
3309	4822 051 30181	180Ω 5% 0.062W
3310	4822 117 12864	82k 5% 0.6W
3311	4822 117 12917	1Ω 5% 0.062W 0603
3315	5322 117 11726	10Ω 5%
3318	5322 117 11726	10Ω 5%
3325	4822 117 11449	2k2 5% 0.1W 0805
3327	4822 117 11449	2k2 5% 0.1W 0805
3328	4822 051 30102	1k 5% 0.062W
3330	5322 117 11726	10Ω 5%
3336	4822 051 30475	4M7 5% 0.062W
3337	5322 117 11726	10Ω 5%
3340	4822 051 30103	10k 5% 0.062W
3355	5322 117 11726	10Ω 5%
3361	4822 051 30475	4M7 5% 0.062W
3362	5322 117 11726	10Ω 5%
3401	4822 051 30102	1k 5% 0.062W
3402	4822 051 30472	4k7 5% 0.062W
3403	4822 051 30102	1k 5% 0.062W
3404	4822 051 30472	4k7 5% 0.062W
3406	4822 117 12902	8k2 1% 0.063W 0603
3407	4822 117 13632	100k 1% 0.62W 0603
3408	4822 117 13632	100k 1% 0.62W 0603
3409	4822 051 30181	180Ω 5% 0.062W
3410	4822 117 12864	82k 5% 0.6W
3411	4822 051 30153	15k 5% 0.062W
3415	5322 117 11726	10Ω 5%
3418	5322 117 11726	10Ω 5%
3425	4822 117 11449	2k2 5% 0.1W 0805
3427	4822 117 11449	2k2 5% 0.1W 0805
3428	4822 051 30102	1k 5% 0.062W
3430	5322 117 11726	10Ω 5%
3436	4822 051 30475	4M7 5% 0.062W
3437	5322 117 11726	10Ω 5%
3440	4822 051 30103	10k 5% 0.062W
3455	5322 117 11726	10Ω 5%
3461	4822 051 30475	4M7 5% 0.062W
3462	5322 117 11726	10Ω 5%
3501	4822 051 30102	1k 5% 0.062W
3502	4822 051 30472	4k7 5% 0.062W
3503	4822 051 30102	1k 5% 0.062W
3504	4822 051 30472	4k7 5% 0.062W
3506	4822 117 12902	8k2 1% 0.063W 0603
3507	4822 117 13632	100k 1% 0.62W 0603
3508	4822 117 13632	100k 1% 0.62W 0603
3509	4822 051 30181	180Ω 5% 0.062W
3510	4822 117 12864	82k 5% 0.6W
3511	4822 051 30682	6k8 5% 0.062W
3515	5322 117 11726	10Ω 5%
3518	5322 117 11726	10Ω 5%
3525	4822 117 11449	2k2 5% 0.1W 0805
3527	4822 117 11449	2k2 5% 0.1W 0805
3528	4822 051 30102	1k 5% 0.062W
3530	5322 117 11726	10Ω 5%
3536	4822 051 30475	4M7 5% 0.062W
3537	5322 117 11726	10Ω 5%
3540	4822 051 30103	10k 5% 0.062W
3555	5322 117 11726	10Ω 5%
3561	4822 051 30475	4M7 5% 0.062W
3562	5322 117 11726	10Ω 5%
3601	4822 051 30102	1k 5% 0.062W
3602	4822 051 30472	4k7 5% 0.062W
3603	4822 051 30102	1k 5% 0.062W
3604	4822 051 30472	4k7 5% 0.062W
3606	4822 117 12902	8k2 1% 0.063W 0603
3607	4822 117 13632	100k 1% 0.62W 0603
3608	4822 117 13632	100k 1% 0.62W 0603
3609	4822 051 30181	180Ω 5% 0.062W
3610	4822 117 12864	82k 5% 0.6W
3611	4822 051 30223	22k 5% 0.062W
3615	5322 117 11726	10Ω 5%
3618	5322 117 11726	10Ω 5%
3625	4822 117 11449	2k2 5% 0.1W 0805
3627	4822 117 11449	2k2 5% 0.1W 0805
3628	4822 051 30102	1k 5% 0.062W
3630	5322 117 11726	10Ω 5%
3636	4822 051 30475	4M7 5% 0.062W
3637	5322 117 11726	10Ω 5%
3640	4822 051 30103	10k 5% 0.062W
3655	5322 117 11726	10Ω 5%
3661	4822 051 30475	4M7 5% 0.062W
3662	5322 117 11726	10Ω 5%
3732	4822 051 30272	2k7 5% 0.062W
3733	4822 051 30102	1k 5% 0.062W
3742	4822 051 30272	2k7 5% 0.062W
3743	4822 051 30102	1k 5% 0.062W
3749	4822 051 30103	10k 5% 0.062W
3750	4822 051 30471	470Ω 5% 0.062W
3751	4822 117 12925	47k 1% 0.063W 0603
3752	4822 117 12925	47k 1% 0.063W 0603
3754	4822 051 30102	1k 5% 0.062W
3755	4822 117 13632	100k 1% 0.62W 0603
3760	4822 051 30471	470Ω 5% 0.062W
3765	4822 117 13632	100k 1% 0.62W 0603
3770	4822 117 13632	100k 1% 0.62W 0603
3771	4822 117 13632	100k 1% 0.62W 0603
3780	4822 117 13632	100k 1% 0.62W 0603
3781	4822 117 13632	100k 1% 0.62W 0603

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5335	4822 157 11717	Bead 100MHz 50Ω
5360	4822 157 11717	Bead 100MHz 50Ω
5365	2422 536 00338	33µH 10%
5435	4822 157 11717	Bead 100MHz 50Ω
5460	4822 157 11717	Bead 100MHz 50Ω
5465	2422 536 00338	33µH 10%
5535	4822 157 11717	Bead 100MHz 50Ω
5560	4822 157 11717	Bead 100MHz 50Ω
5565	2422 536 00338	33µH 10%

5635	4822 157 11717	Bead 100MHz 50Ω
5660	4822 157 11717	Bead 100MHz 50Ω
5665	2422 536 00338	33µH 10%
5714	4822 157 11717	Bead 100MHz 50Ω
5719	4822 157 11717	Bead 100MHz 50Ω
5725	4822 157 11717	Bead 100MHz 50Ω
5753	2422 549 43769	Bead 100MHz 30Ω

6328	4822 130 11397	BAS316
6334	4822 130 11148	UDZ4.7B
6335	4822 130 11148	UDZ4.7B
6355	4822 130 11148	UDZ4.7B
6356	4822 130 11148	UDZ4.7B
6359	4822 130 11148	UDZ4.7B
6360	4822 130 11148	UDZ4.7B
6428	4822 130 11397	BAS316
6434	4822 130 11148	UDZ4.7B
6435	4822 130 11148	UDZ4.7B
6455	4822 130 11148	UDZ4.7B
6456	4822 130 11148	UDZ4.7B
6459	4822 130 11148	UDZ4.7B
6460	4822 130 11148	UDZ4.7B
6528	4822 130 11397	BAS316
6534	4822 130 11148	UDZ4.7B
6535	4822 130 11148	UDZ4.7B
6555	4822 130 11148	UDZ4.7B
6556	4822 130 11148	UDZ4.7B
6559	4822 130 11148	UDZ4.7B
6560	4822 130 11148	UDZ4.7B
6628	4822 130 11397	BAS316
6634	4822 130 11148	UDZ4.7B
6635	4822 130 11148	UDZ4.7B
6655	4822 130 11148	UDZ4.7B
6656	4822 130 11148	UDZ4.7B
6659	4822 130 11148	UDZ4.7B
6660	4822 130 11148	UDZ4.7B
6732	4822 130 11551	UDZS10B
6742	4822 130 11551	UDZS10B
6750	4822 130 10328	BAV99W
6760	4822 130 10328	BAV99W

7211	3198 010 42320	BC857BW
7225	4822 209 30095	LM833D
7238	4822 209 30095	LM833D
7260	4822 209 30095	LM833D
7302	3198 010 42310	BC847BW
7303	3198 010 42310	BC847BW
7315	9338 028 20668	LM311D
7330	4822 130 42804	BC817-25
7340	3198 010 42310	BC847BW
7355	5322 130 60845	BC807-25
7365	9322 161 86668	IRF7343
7402	3198 010 42310	BC847BW
7403	3198 010 42310	BC847BW
7415	9338 028 20668	LM311D
7430	4822 130 42804	BC817-25
7440	3198 010 42310	BC847BW
7455	5322 130 60845	BC807-25
7465	9322 161 86668	IRF7343
7502	3198 010 42310	BC847BW
7503	3198 010 42310	BC847BW
7515	9338 028 20668	LM311D
7530	4822 130 42804	BC817-25
7540	3198 010 42310	BC847BW
7555	5322 130 60845	BC807-25
7565	9322 161 86668	IRF7343
7602	3198 010 42310	BC847BW
7603	3198 010 42310	BC847BW
7615	9338 028 20668	LM311D
7630	4822 130 42804	BC817-25
7640	3198 010 42310	BC847BW
7655	5322 130 60845	BC807-25
7665	9322 161 86668	IRF7343
7735	4822 130 60142	BC869
7736	3198 010 42310	BC847BW
7745	5322 130 61569	BC868
7746	3198 010 42320	BC857BW
7751	3198 010 42310	BC847BW
7753	3198 010 42320	BC857BW
7755	3198 010 42310	BC847BW
7761	3198 010 42320	BC857BW

Led/Switch Panel [LD]

Various

0317	2422 025 13369	Socket 6P (ICON)
0320	2422 025 16545	10P male hor
1101	2422 128 02927	Switch push 2P

2107	4822 124 12095	100µF 20% 16V
2120	2020 024 90166	10µF 20% 35V
2126	2020 552 96326	220nF 10% 16V

3101	4822 051 30151	150Ω 5% 0.062W
3102	4822 117 13632	100k 1% 0.62W 0603
3103	4822 051 30102	1k 5% 0.062W
3104	4822 117 13632	100k 1% 0.62W 0603
3105	4822 051 30102	1k 5% 0.062W
3106	4822 051 30151	150Ω 5% 0.062W
3107	4822 051 30471	470Ω 5% 0.062W
3108	4822 051 30103	10k 5% 0.062W
3109	4822 051 30101	100Ω 5% 0.062W
3120	4822 051 30472	4k7 5% 0.062W
3121	4822 051 30472	4k7 5% 0.062W
3122	4822 051 30102	1k 5% 0.062W
3123	4822 051 30103	10k 5% 0.062W
3124	4822 051 30102	1k 5% 0.062W
3125	4822 051 30332	3k3 5% 0.062W
3126	4822 051 30474	470k 5% 0.062W
3127	4822 051 30474	470k 5% 0.062W

5100	2422 549 43769	Bead 100MHz 30Ω

6101	4822 130 11564	UDZ3.9B
6103	4822 130 83915	TLMV3100
6105	4822 130 11564	UDZ3.9B
6127	9322 140 63685	Optical sensor TEMD5000

7103	9340 218 50115	BC857BW
7105	9340 218 50115	BC857BW
7107	9322 155 82667	IR receiver TSOP2236
7107	9322 178 03667	IR receiverTSOP2136YA1
7120	5322 209 82941	LM358D

Power Supply [P]

Various

0006	4822 265 11253	Fuse holder 2P
0008	4822 265 11253	Fuse holder 2P
0010	3122 421 60171	Spring
0011	3122 421 60171	Spring
0015	4822 695 00005	Insulating plate
0016	3122 121 67211	Clip MAX247
0017	3122 121 67201	Clip large GBU
0018	3122 121 67201	Clip large GBU
0020	3122 121 67191	Clip small
0021	3122 121 67191	Clip small
0022	3122 121 67191	Clip small
0023	3122 121 67191	Clip small
0024	3122 121 67191	Clip small
0025	3122 121 67191	Clip small
0027	3122 121 67191	Clip small
0028	4822 701 13088	Clip for heat sink
0029	4822 701 13088	Clip for heat sink
0041	3122 124 36011	Thermo foam sheet
0206	3104 308 78231	Cooling clip TO-220
0302	2422 025 10769	9P male vert 2.00
0305	2422 025 10772	12P male vert. 2.00
0306	2422 025 08149	6P male vert. 2.00
0308	4822 265 20723	2P male 7.92
0319	2422 025 10668	13P male vert. 2.00
0323	2422 025 15085	10P male vert. 3.96
0333	2422 025 12827	9P male vert. 3.96
0342	4822 267 10618	7P male vert. 2.00
0352	4822 267 10618	7P mlae vert. 2.00
0389	4822 267 10735	3P male vert. 2.00
0390	4822 267 10735	3P male vert. 2.00
1004	4822 070 33152	Fuse 3.15A
1005	4822 071 55002	Fuse 5A
1041	4822 071 55002	Fuse 5A
1042	4822 071 55002	Fuse 5A
1043	4822 071 55002	Fuse 5A
1044	4822 071 55002	Fuse 5A
1045	4822 071 55002	Fuse 5A
1084	2422 086 10849	FUSE 1A 250V
1110	4822 071 55002	Fuse 5A
1200	9965 000 07788	FUSE T2A 250V UL
1260	2122 662 00107	Resettable fuse 750mA
1400	4822 253 30467	Fuse 6,3A
1401	9965 000 07788	FUSE T2A 250V UL
1402	4822 252 60151	Surge prot. DSP-501N-A21F
1450	4822 280 10382	Relay 1P SDT-SS-109DM
1460	4822 280 10382	Relay 1P SDT-SS-109DM

2000	2020 554 90148	470pF 20% 250V
2001	2222 151 90062	47µF 20% 450V
2002	4822 124 40207	100µF 20% 25V
2003	4822 124 12056	1000µF 20% 35V
2004	2222 464 90017	220pF 1% 630V
2005	4822 121 51288	100pF 630V
2006	3198 016 31020	1nF 25V 0603
2007	2238 586 59812	100nF 10% 16V 0603
2008	5322 126 11583	10nF 10% 50V 0603
2009	4822 124 22652	2.2µF 20% 50V
2010	5322 126 11583	10nF 10% 50V 0603
2011	2222 375 24153	15nF 5% 1kVB
2012	4822 126 11254	330pF 10% 2kV
2013	4822 126 11254	330pF 10% 2kV
2014	4822 126 13862	1.5nF 10% 2kV
2015	5322 126 11583	10nF 10% 50V 0603
2016	4822 124 22652	2.2µF 20% 50V
2017	2222 375 24153	15nF 5% 1kV
2022	4822 124 12056	1000µF 20% 35V
2023	2238 586 59812	100nF 10% 16V 0603
2024	5322 126 11579	3.3nF 10% 63V
2025	2020 321 90041	180nF 5% 250V
2026	4822 126 14238	2.2nF 50V 0603
2027	3198 017 31530	15nf %0V 0603
2029	4822 126 13883	220pF 5% 50V
2030	2238 586 59812	100nF 10% 16V 0603
2032	4822 126 14494	22nF 10% 25V 0603
2033	2238 586 59812	100nF 10% 16V 0603
2034	4822 126 11979	27pF 5% 2kV
2035	2238 586 15623	1nF 10% 50V 0603
2036	4822 126 14494	22nF 10% 25V 0603
2038	3198 016 31020	1nF 25V 0603
2040	2238 586 59812	100nF 10% 16V 0603
2043	2222 056 59222	2200µF 100V
2045	4822 126 13883	220pF 5% 50V
2050	2238 586 59812	100nF 10% 16V 0603
2058	4822 124 40756	1µF 20% 100V
2059	2238 586 59812	100nF 10% 16V 0603
2061	2238 586 59812	100nF 10% 16V 0603
2090	4822 124 40769	4.7µF 20% 100V
2110	5322 126 11583	10nF 10% 50V 0603
2111	4822 126 13883	220pF 5% 50V
2112	3198 016 31020	1nF 25V 0603
2113	4822 124 80875	220µF 20% 25V
2114	4822 126 13473	220nF 80-20% 50V
2117	2222 780 15656	330nF 10% 16V
2118	4822 126 13449	1nF 10% 2kV
2121	2222 056 59222	2200µF 100V
2122	4822 124 40756	1µF 20% 100V
2123	5322 126 11579	3.3nF 10% 63V
2126	2238 586 59812	100nF 10% 16V 0603
2133	3198 029 32290	22µF 20% 25V
2138	4822 124 21913	1µF 20% 63V
2203	2238 586 59812	100nF 10% 16V 0603
2205	3198 032 64090	2.2µF 20% 25V
2210	4822 124 40433	47µF 20% 25V
2211	4822 126 13883	220pF 5% 50V
2212	4822 126 13879	220nF 20% 16V
2217	2222 780 15656	330nF 10% 16V
2218	2222 375 90141	3.3nF 5% 1.6kV
2219	2020 021 91543	47µF 20% 160V
2222	2020 552 94427	100pF 5% 50V 0603
2223	2020 552 94427	100pF 5% 50V 0603
2224	2020 021 91551	2200µF 20% 25V
2225	2020 021 91551	2200µF 20% 25V
2226	2238 586 59812	100nF 10% 16V 0603
2227	2020 552 94427	100pF 5% 50V 0603
2228	2020 021 91411	1000µF 20% 35V
2230	5322 121 10472	47µF 25V
2231	5322 121 10472	47µF 25V
2232	2020 552 94427	100pF 5% 50V 0603
2260	4822 126 14043	1µF 20% 16V
2261	2020 021 91411	1000µF 20% 35V
2262	4822 126 13473	220nF 80-20% 50V
2263	2222 861 15272	2.7nF 5% 50V
2264	4822 126 13482	470nF 80/20% 16V
2265	4822 126 14241	330pF 50V 0603
2266	4822 126 14494	22nF 10% 25V 0603
2267	5322 126 10223	4.7nF 10% 63V
2268	4822 126 13473	220nF 80-20% 50V
2269	2020 021 91524	220µF 20% 25V

2270	4822 124 40433	47µF 20% 25V
2290	5322 126 11583	10nF 10% 50V 0603
2291	4822 126 13883	220pF 5% 50V
2292	2020 021 91354	1000µF 20% 50V
2293	4822 126 13883	220pF 5% 50V
2294	2020 021 91354	1000µF 20% 50V
2303	4822 121 42408	220nF 5% 63V
2304	3198 016 31020	1nF 25V 0603
2305	2238 586 59812	100nF 10% 16V 0603
2306	2238 586 59812	100nF 10% 16V 0603
2316	2238 586 59812	100nF 10% 16V 0603
2322	2238 586 59812	100nF 10% 16V 0603
2324	2238 586 59812	100nF 10% 16V 0603
2343	4822 124 22652	2.2µF 20% 50V
2350	4822 124 40207	100µF 20% 25V
2352	2238 586 59812	100nF 10% 16V 0603
2364	2238 586 59812	100nF 10% 16V 0603
2366	2238 586 59812	100nF 10% 16V 0603
2370	2238 586 59812	100nF 10% 16V 0603
2376	2238 586 59812	100nF 10% 16V 0603
2380	2238 586 59812	100nF 10% 16V 0603
2381	2238 586 59812	100nF 10% 16V 0603
2385	3198 017 41050	1µF 10V 0603
2393	2238 586 59812	100nF 10% 16V 0603
2396	4822 121 42408	220nF 5% 63V
2400	4822 126 13589	470nF 275V
2401	4822 126 13589	470nF 275V
2404	4822 126 14525	47pF 5% 1kV
2405	2020 554 90148	470pF 20% 250V
2406	4822 126 14525	47pF 5% 1kV
2407	2020 554 90148	470pF 20% 250V
2410	4822 126 13589	470nF 275V
2465	4822 124 40207	100µF 20% 25V
2503	2222 151 90062	47µF 20% 450V
2504	5322 126 11578	1nF 10% 50V 0603
2505	2020 021 91354	1000µF 20% 50V
2507	2020 552 94427	100pF 5% 50V 0603
2508	4822 124 12032	4.7µF 20% 50V
2509	2020 552 94427	100pF 5% 50V 0603
2510	4822 124 81145	1000µF 20% 16V
2511	2238 586 59812	100nF 10% 16V 0603
2512	2238 586 59812	100nF 10% 16V 0603
2513	2238 586 59812	100nF 10% 16V 0603
2530	5322 124 40641	10µF 20% 100V
2532	4822 124 40207	100µF 20% 25V
2533	4822 124 40207	100µF 20% 25V
2540	4822 124 40207	100µF 20% 25V
2541	4822 124 40207	100µF 20% 25V
2600	4822 122 33799	1nF 10% 1kV
2601	4822 122 33799	1nF 10% 1kV
2605	2222 479 90086	1µF 5% 400V
2608	3198 016 31020	1nF 25V 0603
2610	4822 121 70584	1.8nF 5% 2kV
2611	2222 375 90276	220pF 5% 2kV
2612	5322 126 11578	1nF 10% 50V 0603
2613	5322 126 11578	1nF 10% 50V 0603
2616	2222 057 36221	220µF 20% 400V
2617	2222 057 36221	220µF 20% 400V
2640	4822 126 13881	470pF 5% 50V
2642	3198 016 31020	1nF 25V 0603
2651	5322 126 11583	10nF 10% 50V 0603
2653	4822 126 14241	330pF 50V 0603
2654	4822 124 40433	47µF 20% 25V
2655	4822 121 51319	1µF 10% 63V
2656	2238 586 59812	100nF 10% 16V 0603
2662	4822 124 80061	1000µF 20% 25V
2663	4822 124 40255	100µF 20% 63V
2664	4822 124 40255	100µF 20% 63V
2665	4822 126 13881	470pF 5% 50V
2666	4822 126 13193	4.7nF 10% 63V
2670	2238 586 59812	100nF 10% 16V 0603
2671	2238 586 59812	100nF 10% 16V 0603
2672	2238 586 59812	100nF 10% 16V 0603
2673	4822 121 43343	4.7nF 10% 400V
2674	4822 121 41664	22nF 10% 400V
2700	4822 124 80791	470µF 20% 16V
2703	4822 124 80791	470µF 20% 16V
2709	4822 124 80791	470µF 20% 16V

3003	4822 117 12864	82k 5% 0.6W
3004	4822 051 30153	15k 5% 0.062W
3005	4822 051 30333	33k 5% 0.062W
3006	4822 051 30103	10k 5% 0.062W
3007	4822 051 30472	4k7 5% 0.062W
3008	4822 051 30102	1k 5% 0.062W
3009	4822 051 30102	1k 5% 0.062W
3010	4822 051 30153	15k 5% 0.062W
3011	4822 051 30561	560Ω 5% 0.062W
3012	4822 051 30472	4k7 5% 0.062W
3013	4822 051 30103	10k 5% 0.062W
3014	4822 116 52191	33Ω 5% 0.5W
3015	4822 116 52176	10Ω 5% 0.5W
3016	4822 051 30102	1k 5% 0.062W
3017	4822 116 52191	33Ω 5% 0.5W
3018	4822 116 52176	10Ω 5% 0.5W
3019	4822 051 30102	1k 5% 0.062W
3020	4822 051 30563	56k 5% 0.062W
3021	4822 053 11478	4Ω7 5% 2W
3022	4822 051 30331	330Ω 5% 0.062W
3023	4822 117 12925	47k 1% 0.063W 0603
3024	4822 050 27503	75k 1% 0.6W
3025	4822 117 12903	1k8 1% 0.063W 0603
3026	4822 101 11186	470Ω 30% LIN
3027	4822 117 12925	47k 1% 0.063W 0603
3028	4822 117 10362	7k5 1% 0.1W
3029	4822 051 30102	1k 5% 0.062W
3030	4822 051 30183	18k 5% 0.062W
3031	2322 704 61103	11k 1% 0.063W 0603
3032	2322 704 61103	11k 1% 0.063W 0603
3033	4822 051 30222	2k2 5% 0.062W
3037	4822 051 30103	10k 5% 0.062W
3038	4822 117 13632	100k 1% 0.62W 0603
3039	4822 051 30105	1M 5% 0.062W
3040	4822 117 10837	100k 1% 0.1W
3041	4822 051 30333	33k 5% 0.062W
3042	4822 051 30471	470Ω 5% 0.062W
3043	4822 051 30472	4k7 5% 0.062W
3044	4822 051 30102	1k 5% 0.062W
3045	4822 051 30102	1k 5% 0.062W
3046	4822 053 20565	5M6 5% 0.25W
3047	4822 051 30154	150k 5% 0.062W
3048	4822 051 30472	4k7 5% 0.062W
3049	4822 051 30123	12k 5% 0.062W
3050	4822 052 10398	3Ω9 5% 0.33W
3051	4822 051 20399	39Ω 5% 0.1W
3053	2322 662 93131	PTC 600V 10Ω
3054	4822 050 21003	10k 1% 0.6W
3056	4822 051 30331	330Ω 5% 0.062W
3057	4822 051 30101	100Ω 5% 0.062W
3058	4822 051 20105	1M 5% 0.1W
3062	4822 051 30102	1k 5% 0.062W
3064	4822 051 30103	10k 5% 0.062W
3065	4822 051 30102	1k 5% 0.062W
3066	4822 051 30103	10k 5% 0.062W
3067	4822 051 30153	15k 5% 0.062W
3070	4822 051 30103	10k 5% 0.062W
3071	4822 117 12925	47k 1% 0.063W 0603
3075	4822 116 83866	1M 5% 0.5W
3076	4822 117 13632	100k 1% 0.62W 0603
3077	4822 116 83866	1M 5% 0.5W
3078	4822 117 13632	100k 1% 0.62W 0603
3080	4822 051 30101	100Ω 5% 0.062W
3081	4822 051 30222	2k2 5% 0.062W
3083	4822 051 10102	1k 2% 0.25W
3084	4822 051 30103	10k 5% 0.062W
3085	4822 117 12925	47k 1% 0.063W 0603
3086	4822 117 12925	47k 1% 0.063W 0603
3087	4822 117 12925	47k 1% 0.063W 0603
3088	4822 117 12925	47k 1% 0.063W 0603
3090	4822 051 30101	100Ω 5% 0.062W
3091	4822 051 30102	1k 5% 0.062W
3092	4822 051 30471	470Ω 5% 0.062W
3093	4822 051 30102	1k 5% 0.062W
3095	4822 051 30471	470Ω 5% 0.062W
3096	4822 051 30562	5k6 5% 0.063W 0603
3097	4822 117 12968	820Ω 5% 0.62W
3110	4822 051 30102	1k 5% 0.062W
3111	4822 051 30102	1k 5% 0.062W
3112	4822 051 30102	1k 5% 0.062W
3113	4822 051 30474	470k 5% 0.062W
3114	4822 051 20564	560k 5% 0.1W
3115	4822 117 12891	220k 1%
3116	4822 051 30102	1k 5% 0.062W
3117	4822 051 30103	10k 5% 0.062W
3118	4822 116 83303	0.1Ω 2W
3119	4822 116 83303	0.1Ω 2W
3120	4822 117 12903	1k8 1% 0.063W 0603
3121	4822 117 12925	47k 1% 0.063W 0603
3122	2322 734 67503	75k 1% 0.063W 0805
3123	4822 117 10965	18k 1% 0.1W
3124	2120 108 94004	7k5 1% 0.063W 0603
3125	2120 108 94004	7k5 1% 0.063W 0603
3126	4822 051 30222	2k2 5% 0.062W
3127	4822 101 11187	1k 30% LIN 0.1W
3128	4822 051 30333	33k 5% 0.062W
3129	4822 053 10103	10k 5% 1W
3130	4822 051 30102	1k 5% 0.062W
3131	2322 704 61103	11k 1% 0.063W 0603
3133	4822 051 30101	100Ω 5% 0.062W
3134	4822 051 30331	330Ω 5% 0.062W
3135	4822 117 12925	47k 1% 0.063W 0603
3136	4822 117 12925	47k 1% 0.063W 0603
3138	4822 117 11503	220Ω 1% 0.1W
3139	4822 117 11503	220Ω 1% 0.1W
3140	2322 734 67503	75k 1% 0.063W 0805
3141	2322 734 67503	75k 1% 0.063W 0805
3142	5322 117 12487	1k 1% 0.125W
3146	2306 327 90035	0.22Ω 1% 2W
3147	2322 704 61103	11k 1% 0.063W 0603
3148	4822 117 12925	47k 1% 0.063W 0603
3149	4822 051 30103	10k 5% 0.062W
3150	4822 117 10837	100k 1% 0.1W
3151	4822 051 30103	10k 5% 0.062W
3152	4822 117 11373	100Ω 1% 0805
3200	2322 730 61224	220k 5% 0805
3201	4822 053 10103	10k 5% 1W
3202	4822 051 30479	47Ω 5% 0.062W
3203	4822 051 30101	100Ω 5% 0.062W
3204	4822 117 13632	100k 1% 0.62W 0603
3205	4822 117 13632	100k 1% 0.62W 0603
3212	4822 051 30102	1k 5% 0.062W
3213	4822 051 30105	1M 5% 0.062W
3214	4822 117 12889	270k 1% 0.063W 0603
3216	4822 051 30102	1k 5% 0.062W
3217	4822 051 30103	10k 5% 0.062W
3218	4822 116 83303	Ω1 2W
3219	4822 116 83303	Ω1 2W
3224	5322 117 13028	12k 1% 0.063W 0603
3225	2322 704 61103	11k 1% 0.063W 0603
3226	4822 051 30103	10k 5% 0.062W
3228	4822 051 30151	150Ω 5% 0.062W
3260	4822 051 30102	1k 5% 0.062W
3261	4822 051 30102	1k 5% 0.062W
3262	4822 117 11188	20k 1% 0.1W
3264	4822 051 30682	6k8 5% 0.062W
3265	4822 051 30102	1k 5% 0.062W
3268	4822 051 30102	1k 5% 0.062W
3292	4822 051 30561	560Ω 5% 0.062W
3300	4822 117 13579	220k 1% 0.1W 0805
3301	4822 117 13579	220k 1% 0.1W 0805
3304	4822 051 30102	1k 5% 0.062W
3306	2322 704 61103	11k 1% 0.063W 0603
3307	5322 117 13028	12k 1% 0.063W 0603
3308	4822 051 30102	1k 5% 0.062W
3309	4822 051 30102	1k 5% 0.062W
3310	4822 051 30472	4k7 5% 0.062W
3311	4822 117 13579	220k 1% 0.1W 0805
3312	4822 051 30102	1k 5% 0.062W
3313	2120 108 94004	7k5 1% 0.063W 0603
3317	2120 108 94004	7k5 1% 0.063W 0603
3318	4822 051 30102	1k 5% 0.062W
3319	4822 051 30472	4k7 5% 0.062W
3320	2322 704 61103	11k 1% 0.063W 0603
3321	4822 051 30102	1k 5% 0.062W
3322	5322 117 13042	3k9 1% 0.063W 0603
3323	4822 117 10833	10k 1% 0.1W
3324	4822 051 30102	1k 5% 0.062W
3325	4822 051 30471	470Ω 5% 0.062W
3326	4822 051 30472	4k7 5% 0.062W
3327	4822 051 30103	10k 5% 0.062W
3328	4822 051 30103	10k 5% 0.062W
3330	4822 051 30102	1k 5% 0.062W
3331	4822 051 30472	4k7 5% 0.062W
3332	4822 117 11144	3k9 1% 0.1W
3333	4822 051 30102	1k 5% 0.062W
3334	4822 117 12955	2k7 1% 0.1W 0805
3335	4822 116 83933	15k 1% 0.1W
3338	4822 051 30102	1k 5% 0.062W
3339	4822 051 30472	4k7 5% 0.062W
3340	4822 051 30102	1k 5% 0.062W
3341	4822 051 30103	10k 5% 0.062W
3342	4822 051 30103	10k 5% 0.062W
3343	4822 051 30102	1k 5% 0.062W
3344	4822 051 30102	1k 5% 0.062W
3345	4822 051 30472	4k7 5% 0.062W
3346	4822 051 30102	1k 5% 0.062W
3347	4822 051 30331	330Ω 5% 0.062W
3348	4822 051 30331	330Ω 5% 0.062W
3349	4822 051 30102	1k 5% 0.062W
3350	4822 051 30472	4k7 5% 0.062W
3351	4822 051 30103	10k 5% 0.062W
3352	4822 051 30103	10k 5% 0.062W
3353	4822 051 30103	10k 5% 0.062W
3354	4822 051 30472	4k7 5% 0.062W
3358	4822 051 30222	2k2 5% 0.062W
3359	4822 051 30472	4k7 5% 0.062W
3360	4822 117 11817	1k2 1% 1/16W
3361	4822 051 30472	4k7 5% 0.062W
3362	4822 051 30102	1k 5% 0.062W
3363	4822 051 30102	1k 5% 0.062W
3364	4822 051 30102	1k 5% 0.062W
3365	4822 051 30102	1k 5% 0.062W
3366	4822 051 30103	10k 5% 0.062W
3367	4822 051 30103	10k 5% 0.062W
3368	2120 660 90042	PTC 16V 330Ω
3369	4822 051 30272	2k7 5% 0.062W
3370	4822 051 30101	100Ω 5% 0.062W
3371	4822 051 30101	100Ω 5% 0.062W
3373	4822 051 30472	4k7 5% 0.062W

3374	4822 117 12925	47k 1% 0.063W 0603
3376	4822 117 12925	47k 1% 0.063W 0603
3377	4822 051 30472	4k7 5% 0.062W
3378	4822 051 30103	10k 5% 0.062W
3380	4822 117 12925	47k 1% 0.063W 0603
3381	4822 117 12925	47k 1% 0.063W 0603
3382	5322 117 13039	220k 1% 0.063W 0603 RC22H
3385	4822 117 13632	100k 1% 0.62W 0603
3386	4822 117 13632	100k 1% 0.62W 0603
3387	4822 051 30471	470Ω 5% 0.062W
3388	4822 051 30102	1k 5% 0.062W
3389	4822 051 30102	1k 5% 0.062W
3390	4822 051 30103	10k 5% 0.062W
3391	4822 051 30103	10k 5% 0.062W
3392	4822 051 30102	1k 5% 0.062W
3393	4822 051 30103	10k 5% 0.062W
3394	4822 051 30102	1k 5% 0.062W
3395	4822 051 30103	10k 5% 0.062W
3400	2322 595 90021	VDR 1mA/495V MAX 850V
3401	4822 117 10118	1M 5% 0.5W
3402	4822 053 21475	4M7 5% 0.5W
3403	4822 053 21475	4M7 5% 0.5W
3404	4822 116 83872	220Ω 5% 0.5W
3450	2322 662 93131	PTC 600V 10Ω
3451	2322 662 93131	PTC 600V 10Ω
3452	2122 612 00051	NTC B57464 6.7W S 1Ω 20%
3453	2122 612 00051	NTC B57464 6.7W S 1Ω 20%
3460	4822 051 30472	4k7 5% 0.062W
3461	4822 051 30103	10k 5% 0.062W
3463	4822 051 30103	10k 5% 0.062W
3465	4822 051 30103	10k 5% 0.062W
3467	4822 051 30103	10k 5% 0.062W
3469	4822 051 30472	4k7 5% 0.062W
3470	4822 051 30103	10k 5% 0.062W
3501	4822 051 30101	100Ω 5% 0.062W
3502	4822 051 30471	470Ω 5% 0.062W
3503	5322 117 13026	4k7 1% 0.063W 0603
3504	5322 117 13024	33k 1% 0.063W 0603 RC22H
3505	4822 117 11139	1k5 1% 0.1W
3506	2322 662 93131	PTC 600V 10Ω
3507	4822 053 20225	2M2 5% 0.25W
3508	2322 194 63109	10Ω 5% @W
3520	4822 051 30109	10Ω 5% 0.062W
3530	4822 117 13632	100k 1% 0.62W 0603
3608	4822 116 52179	12Ω 5% 0.5W
3610	5322 116 53564	3Ω3 5% 0.5W
3611	4822 050 11002	1k 1% 0.4W
3614	2120 106 90565	0.1Ω 5% 2W
3615	2120 106 90565	0.1Ω 5% 2W
3639	4822 051 30102	1k 5% 0.062W
3640	4822 051 30331	330Ω 5% 0.062W
3641	4822 051 30471	470Ω 5% 0.062W
3642	4822 051 30101	100Ω 5% 0.062W
3650	2322 156 21305	1M3 1%
3651	4822 051 30103	10k 5% 0.062W
3652	4822 051 30105	1M 5% 0.062W
3653	4822 116 52231	820Ω 5% 0.5W
3654	4822 051 30103	10k 5% 0.062W
3655	4822 051 30102	1k 5% 0.062W
3663	4822 052 10108	1Ω 5% 0.33W
3664	2322 734 62704	27OK 1% 0.1W 0805
3665	4822 051 30103	10k 5% 0.062W
3666	4822 116 52175	100Ω 5% 0.5W
3668	4822 052 11102	1k 5% 0.5W
3670	4822 050 27504	750k 1% 0.6W
3671	4822 117 10833	10k 1% 0.1W
3673	4822 052 11102	1k 5% 0.5W
3674	4822 053 20105	1M 5% 0.25W
3675	4822 053 10221	220Ω 5% 1W
3700	4822 051 30331	330Ω 5% 0.062W
3701	4822 051 30222	2k2 5% 0.062W
3702	4822 051 30222	2k2 5% 0.062W
3703	4822 051 30102	1k 5% 0.062W
3706	4822 051 30331	330Ω 5% 0.062W
3707	4822 051 30222	2k2 5% 0.062W
3708	4822 051 30222	2k2 5% 0.062W
3709	4822 051 30102	1k 5% 0.062W
3999	4822 051 30102	1k 5% 0.062W

5001	8222 289 53691	Driver transf. CE136H
5003	4822 157 71442	150µH 10%
5120	3128 138 40381	Coil CU20V
5200	3198 018 71010	100µH 10%
5220	3128 138 70541	VCC transf. CT296F
5224	2422 535 95273	6.8µH 20%
5225	2422 535 95273	6.8µH 20%
5260	3198 018 71010	100µH 10%
5268	2422 536 00288	100µH 10%
5290	3128 138 40391	Audio transf. CU15
5291	4822 157 71467	39U 10%
5292	4822 157 71467	39U 10%
5293	4822 157 71467	39U 10%
5401	3122 138 38901	Mains filter CU28D3
5402	3122 138 38901	Mains filter CU28D3
5404	3122 138 38901	Mains filter CU28D3
5500	3128 138 40361	Standby transf. CE165T
5505	4822 157 71467	39µH 10%
5612	4822 157 11411	Bead 100MHz
5703	4822 157 71414	1000µH 10%
5704	4822 157 11499	Bead 100MHz 60Ω
5709	4822 157 71414	1000µH 10%
5710	4822 157 11499	Bead 100MHz 60Ω



6004	4822 130 11397	BAS316
6005	4822 130 11397	BAS316
6007	4822 130 30621	1N4148
6008	4822 130 30621	1N4148
6009	4822 130 11397	BAS316
6010	4822 130 11397	BAS316
6011	4822 130 11397	BAS316
6012	4822 130 34281	BZX79-B15
6013	4822 130 34281	BZX79-B15
6018	4822 130 11397	BAS316
6019	4822 130 11397	BAS316
6021	9340 550 66112	BYV28-200/24
6022	4822 130 11397	BAS316
6023	4822 130 11397	BAS316
6027	4822 130 30621	1N4148
6028	4822 130 30621	1N4148
6031	9322 129 37685	BZM55-C5V6
6032	9322 129 37685	BZM55-C5V6
6033	4822 130 11594	BZX284-C47
6034	4822 130 11397	BAS316
6035	4822 130 11397	BAS316
6041	9322 167 08687	STTH2003CF
6042	9322 150 18685	BZX384-C47
6043	5322 130 31938	BYV27-200
6044	9322 167 08687	STTH2003CF
6045	9340 550 66112	BYV28-200/24
6046	9322 167 08687	STTH2003CF
6047	9322 167 08687	STTH2003CF
6050	4822 130 31024	BZX79-B18
6054	4822 130 42488	BYD33D
6055	4822 130 42488	BYD33D
6061	4822 130 31024	BZX79-B18
6075	9336 018 60133	BZT03-C300
6077	9336 018 60133	BZT03-C300
6086	4822 130 83757	MCL4148
6095	4822 130 11397	BAS316
6111	4822 130 11397	BAS316
6112	4822 130 11397	BAS316
6113	4822 130 11397	BAS316
6117	4822 130 11152	UDZ18B
6120	4822 130 11596	BYW29EX-200
6123	4822 130 11397	BAS316
6133	4822 130 11397	BAS316
6142	9340 550 66112	BYV28-200/24
6202	4822 130 11397	BAS316
6205	4822 130 11152	UDZ18B
6206	4822 130 11397	BAS316
6211	9322 128 65685	RS1G
6213	4822 130 11397	BAS316
6216	4822 130 11152	UDZ18B
6224	9322 173 47687	STPS20L40CFP
6225	9322 173 47687	STPS20L40CFP
6230	9340 550 66112	BYV28-200/24
6232	4822 130 11522	UDZ15B
6260	4822 130 11421	BT151X-500R
6267	9322 161 77682	SB540L-7024
6291	9322 131 78682	D4SBL20US-4100
6312	4822 130 11528	1PS76SB10
6313	4822 130 11528	1PS76SB10
6314	4822 130 11397	BAS316
6321	4822 130 11528	1PS76SB10
6322	4822 130 11528	1PS76SB10
6324	4822 130 11397	BAS316
6325	4822 130 11416	PDZ6.8B
6333	4822 130 11528	1PS76SB10
6334	4822 130 11528	1PS76SB10
6335	4822 130 11397	BAS316
6340	4822 130 11528	1PS76SB10
6341	4822 130 11528	1PS76SB10
6342	4822 130 11397	BAS316
6344	4822 130 10838	UDZ3.3B
6347	4822 130 10654	BAT254
6348	4822 130 20297	BT169B
6362	4822 130 11397	BAS316
6364	4822 130 11397	BAS316
6365	4822 130 11397	BAS316
6375	4822 130 11397	BAS316
6376	4822 130 11397	BAS316
6378	4822 130 11528	1PS76SB10
6390	4822 130 11397	BAS316
6460	4822 130 11397	BAS316
6461	4822 130 11397	BAS316
6470	4822 130 11397	BAS316
6471	4822 130 11397	BAS316
6501	9336 018 60133	BZT03-C300
6502	9336 018 60133	BZT03-C300
6503	9322 128 65685	RS1G
6504	9322 128 65685	RS1G
6505	9322 161 76682	SB340L-7024
6510	9322 099 61685	BYG10J
6511	9322 099 61685	BYG10J
6512	9322 099 61685	BYG10J
6513	9322 099 61685	BYG10J
6520	4822 130 11397	BAS316
6530	4822 130 11152	UDZ18B
6531	4822 130 11152	UDZ18B
6600	9322 131 67679	Bridge GBU8JL-7000
6605	9322 161 81682	1N5406L-7024
6606	9322 161 81682	1N5406L-7024
6608	4822 130 11397	BAS316
6609	4822 130 32152	BZT03-C18
6611	3139 120 52021	BYV29X-500
6640	9339 680 20115	PRLL5819
6641	4822 130 11397	BAS316
6642	9339 680 20115	PRLL5819
6643	4822 130 11152	UDZ18B
6653	9322 129 39685	BZM55-C8V2
6654	4822 130 11397	BAS316
6660	9322 128 65685	RS1G
6661	9322 128 65685	RS1G
6663	4822 130 11397	BAS316
6665	9339 680 20115	PRLL5819
6700	4822 130 11152	UDZ18B
6703	9339 680 20115	PRLL5819
6706	4822 130 11152	UDZ18B
6709	9339 680 20115	PRLL5819



7001	9322 108 21682	MC34067P
7002	9322 149 04682	TCET1102
7003	9322 149 04682	TCET1102
7005	9322 164 01687	STU16NB50I
7006	9322 164 01687	STU16NB50I
7007	4822 130 40854	BC327
7008	4822 130 40854	BC327
7009	3198 010 42310	BC847BW
7010	4822 209 81397	TL431CLPST
7011	4822 209 81397	TL431CLPST
7017	3198 010 42320	BC857BW
7018	3198 010 42310	BC847BW
7020	9335 671 30126	BC517
7021	9335 671 30126	BC517
7022	3198 010 42310	BC847BW
7042	4822 130 41646	BF423
7050	9340 557 17118	PSMN035-150B
7052	9322 165 02668	IRFR18N15D
7058	3198 010 42310	BC847BW
7059	4822 130 41782	BF422
7090	3198 010 42320	BC857BW
7091	3198 010 42320	BC857BW
7092	4822 130 41246	BC327-25
7093	4822 209 80591	LM317T
7110	4822 130 41646	BF423
7111	4822 130 41646	BF423
7112	9352 673 56112	TEA1507P/N1
7117	9340 557 17118	PSMN035-150B
7120	9322 149 04682	TCET1102
7121	4822 209 81397	TL431CLPST
7130	4822 209 81397	TL431CLPST
7134	3198 010 42310	BC847BW
7140	9340 425 10115	BC857BS
7142	4822 130 41646	BF423
7143	3198 010 42310	BC847BW
7144	4822 130 41782	BF422
7145	3198 010 42320	BC857BW
7200	4822 130 63316	BSN304
7202	9965 000 04199	BSN20
7212	9352 673 56112	TEA1507P/N1
7217	9340 557 18127	PSMN070-200P
7220	9322 149 04682	TCET1102
7227	4822 209 81397	TL431CLPST
7230	4822 209 12334	L4940V85
7260	9322 166 31682	L4973V3.3
7304	4822 209 81397	TL431CLPST
7308	4822 209 60177	LM339D
7326	3198 010 42310	BC847BW
7327	3198 010 42310	BC847BW
7330	4822 209 60177	LM339D
7341	3198 010 42320	BC857BW
7348	3198 010 42310	BC847BW

7351	3198 010 42310	BC847BW
7352	3198 010 42310	BC847BW
7362	3198 010 42310	BC847BW
7366	4822 209 63709	LM324D
7370	5322 209 33172	PCF8574AT
7375	3198 010 42310	BC847BW
7376	3198 010 42310	BC847BW
7389	3198 010 42320	BC857BW
7391	3198 010 42320	BC857BW
7393	3198 010 42310	BC847BW
7460	4822 130 42804	BC817-25
7465	3198 010 42320	BC857BW
7470	4822 130 42804	BC817-25
7500	9322 037 99682	TNY256P
7501	9322 149 04682	TCET1102
7502	4822 209 14933	TL431IZ
7530	9322 157 95668	STD16NE06L
7531	9322 157 95668	STD16NE06L
7540	4822 209 80817	L7805CV
7608	5322 130 44593	BC369
7610	9322 130 47687	STY34NB50
7640	4822 130 63316	BSN304
7641	4822 130 40981	BC337-25
7650	9322 130 69682	MC33368P
7654	3198 010 42320	BC857BW
7660	5322 209 71759	MCT7815CT
7700	9322 115 29668	SI9433DY
7701	3198 010 42310	BC847BW
7706	9322 115 29668	SI9433DY
7707	3198 010 42310	BC847BW

Scavio Panel [SC]

Various

0301	2422 025 17396	20P male vert. 1.25
0305	2422 025 16705	12P male vert. 2.00
0318	2422 025 17233	32P female vert. 1.00
0319	2422 025 17047	13P male hor. 2.00
0320	2422 025 16545	10P male hor. 2.00
0375	2422 033 00401	24P female hor. 1.91 DVI-D
0376	2422 025 16768	9P female SUB-D
0378	2422 026 05071	Socket 4 x cinch WH-RD
0378	2422 026 05273	Socket 6 x cinch WH-RD
0379	2422 026 05274	Socket 6 x cinch
0380	2422 026 05275	Socket 6 x cinch
0381	4822 267 10994	Socket SVHS
0382	2422 025 17274	10P male vert.
0385	2422 025 17274	10P male vert.
0388	2422 025 16704	8P male hor. 2.00
1100	2422 086 11009	Fuse SMD T1,0A 63V IEC
1105	2422 086 11031	Fuse SMD F500mA 63V UL
1170	2422 086 11031	Fuse SMD F500mA 63V UL
1171	2422 086 11013	Fuse SMD F315mA 32V UL
1270	2422 086 11031	Fuse SMD F500mA 63V UL
1415	2422 543 89022	Crystal SMD 6MHz
1570	2422 543 01115	Crystal SMD 24.576 MHz
1575	2422 086 11031	Fuse SMD F500mA 63V UL
1670	2422 086 10964	Fuse SMD T630mA 63V IEC

⊣⊢

2000	2238 586 59812	100nF 10% 16V 0603
2001	2238 586 59812	100nF 10% 16V 0603
2002	5322 126 14103	2.2µF 20% 10V
2003	2238 586 59812	100nF 10% 16V 0603
2004	5322 126 14103	2.2µF 20% 10V
2005	5322 126 14103	2.2µF 20% 10V
2007	2238 586 59812	100nF 10% 16V 0603
2008	4822 126 11785	47pF 5% 50V 0603
2009	2238 586 59812	100nF 10% 16V 0603
2012	2238 586 59812	100nF 10% 16V 0603
2014	5322 126 11583	10nF 10% 50V 0603
2015	4822 126 11785	47pF 5% 50V 0603
2020	2238 586 59812	100nF 10% 16V 0603
2021	3198 017 44740	470nF 10V 0603
2022	2238 586 59812	100nF 10% 16V 0603
2030	3198 017 44740	470nF 10V 0603
2034	5322 126 11583	10nF 10% 50V 0603
2040	2238 586 59812	100nF 10% 16V 0603
2041	2238 586 59812	100nF 10% 16V 0603
2042	2238 586 59812	100nF 10% 16V 0603
2060	2238 586 59812	100nF 10% 16V 0603
2061	2238 586 59812	100nF 10% 16V 0603
2066	2238 586 59812	100nF 10% 16V 0603
2072	5322 124 41945	22µF 20% 35V
2077	5322 124 41945	22µF 20% 35V
2082	5322 124 41945	22µF 20% 35V
2088	2238 586 59812	100nF 10% 16V 0603
2089	2238 586 59812	100nF 10% 16V 0603
2090	2238 586 59812	100nF 10% 16V 0603
2097	3198 016 31080	1pF 50V 0603
2103	3198 016 31080	1pF 50V 0603
2105	2238 586 59812	100nF 10% 16V 0603
2106	5322 126 14103	2.2µF 20% 10V
2107	2238 586 59812	100nF 10% 16V 0603
2108	2238 586 59812	100nF 10% 16V 0603
2109	4822 126 13879	220nF 20% 16V
2110	4822 126 13879	220nF 20% 16V
2111	4822 126 13879	220nF 20% 16V
2112	5322 124 41945	22µF 20% 35V
2113	2238 586 59812	100nF 10% 16V 0603
2114	3198 016 31080	1pF 50V 0603
2115	3198 017 34730	47nF 16V 0603
2116	5322 124 41945	22µF 20% 35V
2117	2238 586 59812	100nF 10% 16V 0603
2119	3198 017 34730	47nF 16V 0603
2120	5322 124 41945	22µF 20% 35V
2123	3198 017 34730	47nF 16V 0603
2124	3198 016 31080	1pF 50V 0603
2127	3198 016 31080	1pF 50V 0603
2128	3198 016 31080	1pF 50V 0603
2134	5322 124 41945	22µF 20% 35V
2137	5322 124 41945	22µF 20% 35V
2140	5322 124 41945	22µF 20% 35V
2142	2238 586 59812	100nF 10% 16V 0603
2143	4822 124 12095	100µF 20% 16V
2144	5322 124 41945	22µF 20% 35V
2145	2238 586 59812	100nF 10% 16V 0603
2146	3198 017 34730	47nF 16V 0603
2147	5322 124 41945	22µF 20% 35V
2150	5322 124 41945	22µF 20% 35V
2151	3198 016 31020	1nF 25V 0603
2152	3198 017 34730	47nF 16V 0603
2153	5322 124 41945	22µF 20% 35V
2156	5322 124 41945	22µF 20% 35V
2157	2238 586 59812	100nF 10% 16V 0603
2158	3198 017 34730	47nF 16V 0603
2159	5322 124 41945	22µF 20% 35V
2160	2238 586 59812	100nF 10% 16V 0603
2161	2238 586 59812	100nF 10% 16V 0603
2162	2238 586 59812	100nF 10% 16V 0603
2164	4822 124 12095	100µF 20% 16V
2165	2238 586 59812	100nF 10% 16V 0603
2166	2238 586 59812	100nF 10% 16V 0603
2167	4822 124 12095	100µF 20% 16V
2168	4822 124 23002	10µF 16V
2170	2238 586 59812	100nF 10% 16V 0603
2171	2238 586 59812	100nF 10% 16V 0603
2172	2238 586 59812	100nF 10% 16V 0603
2173	2238 586 59812	100nF 10% 16V 0603
2174	2238 586 59812	100nF 10% 16V 0603
2175	2238 586 59812	100nF 10% 16V 0603
2176	2238 586 59812	100nF 10% 16V 0603
2177	2238 586 59812	100nF 10% 16V 0603
2178	2238 586 59812	100nF 10% 16V 0603
2179	2238 586 59812	100nF 10% 16V 0603
2180	2238 586 59812	100nF 10% 16V 0603
2181	2238 586 59812	100nF 10% 16V 0603
2182	2238 586 59812	100nF 10% 16V 0603
2183	2238 586 59812	100nF 10% 16V 0603
2184	2238 586 59812	100nF 10% 16V 0603
2185	2238 586 59812	100nF 10% 16V 0603
2186	2238 586 59812	100nF 10% 16V 0603
2187	2238 586 59812	100nF 10% 16V 0603
2188	2238 586 59812	100nF 10% 16V 0603
2189	2238 586 59812	100nF 10% 16V 0603
2190	2238 586 59812	100nF 10% 16V 0603
2191	2238 586 59812	100nF 10% 16V 0603
2192	2238 586 59812	100nF 10% 16V 0603
2193	2238 586 59812	100nF 10% 16V 0603
2195	4822 124 23002	10µF 16V
2196	4822 124 23002	10µF 16V
2197	4822 124 23002	10µF 16V
2198	4822 124 23002	10µF 16V
2199	4822 124 23002	10µF 16V
2205	2238 586 59812	100nF 10% 16V 0603
2206	2238 586 59812	100nF 10% 16V 0603
2207	2238 586 59812	100nF 10% 16V 0603
2208	4822 126 14127	39nF 10% 50V
2210	5322 126 11581	3.9nF 10% 63V
2212	2238 586 59812	100nF 10% 16V 0603
2217	2238 586 59812	100nF 10% 16V 0603
2220	4822 124 23002	10µF 16V
2221	4822 124 23002	10µF 16V
2222	4822 124 23002	10µF 16V
2223	4822 124 23002	10µF 16V
2224	4822 124 23002	10µF 16V
2228	4822 124 23002	10µF 16V
2230	2238 586 59812	100nF 10% 16V 0603
2231	2238 586 59812	100nF 10% 16V 0603
2232	2238 586 59812	100nF 10% 16V 0603
2240	2238 586 59812	100nF 10% 16V 0603
2247	2238 586 59812	100nF 10% 16V 0603
2248	2238 586 59812	100nF 10% 16V 0603
2249	2238 586 59812	100nF 10% 16V 0603
2250	2238 586 59812	100nF 10% 16V 0603
2260	3198 017 34730	47nF 16V 0603
2261	3198 017 34730	47nF 16V 0603
2262	3198 017 34730	47nF 16V 0603
2263	3198 017 34730	47nF 16V 0603
2264	3198 017 34730	47nF 16V 0603
2265	3198 017 34730	47nF 16V 0603
2266	3198 017 34730	47nF 16V 0603
2267	3198 017 34730	47nF 16V 0603
2268	3198 017 34730	47nF 16V 0603
2269	3198 017 34730	47nF 16V 0603
2270	3198 017 34730	47nF 16V 0603
2274	3198 017 34730	47nF 16V 0603
2275	3198 017 34730	47nF 16V 0603
2276	3198 017 34730	47nF 16V 0603
2280	2238 586 59812	100nF 10% 16V 0603
2281	2238 586 59812	100nF 10% 16V 0603
2282	2238 586 59812	100nF 10% 16V 0603
2283	2238 586 59812	100nF 10% 16V 0603
2284	2238 586 59812	100nF 10% 16V 0603
2285	2238 586 59812	100nF 10% 16V 0603
2286	2238 586 59812	100nF 10% 16V 0603
2287	2238 586 59812	100nF 10% 16V 0603
2288	2238 586 59812	100nF 10% 16V 0603
2300	4822 124 12095	100µF 20% 16V
2301	2238 586 59812	100nF 10% 16V 0603
2302	4822 124 23002	10µF 16V
2304	2238 586 59812	100nF 10% 16V 0603
2308	5322 124 41945	22µF 20% 35V
2310	2238 586 59812	100nF 10% 16V 0603
2311	2238 586 59812	100nF 10% 16V 0603
2318	5322 124 41945	22µF 20% 35V
2328	5322 124 41945	22µF 20% 35V
2337	2020 552 94427	100pF 5% 50V 0603
2340	2238 586 59812	100nF 10% 16V 0603
2351	2238 586 59812	100nF 10% 16V 0603
2352	2238 586 59812	100nF 10% 16V 0603
2353	4822 124 23002	10µF 16V
2354	2238 586 59812	100nF 10% 16V 0603
2355	2238 586 59812	100nF 10% 16V 0603
2356	2238 586 59812	100nF 10% 16V 0603
2365	2238 586 59812	100nF 10% 16V 0603
2370	2238 586 59812	100nF 10% 16V 0603
2372	2238 586 59812	100nF 10% 16V 0603
2375	2238 586 59812	100nF 10% 16V 0603
2381	2238 586 59812	100nF 10% 16V 0603
2382	2238 586 59812	100nF 10% 16V 0603
2383	2238 586 59812	100nF 10% 16V 0603
2415	2238 867 75339	33pF 5% 50V 0603
2416	4822 126 11669	27pF 10% 50V
2418	3198 016 31020	1nF 25V 0603
2419	3198 016 31020	1nF 25V 0603
2420	2238 586 59812	100nF 10% 16V 0603
2432	2238 586 59812	100nF 10% 16V 0603
2433	2238 586 59812	100nF 10% 16V 0603
2434	2238 586 59812	100nF 10% 16V 0603
2435	2238 586 59812	100nF 10% 16V 0603
2436	2238 586 59812	100nF 10% 16V 0603
2437	2238 586 59812	100nF 10% 16V 0603
2438	4822 126 13879	220nF 20% 16V
2439	4822 126 13879	220nF 20% 16V
2446	2238 586 59812	100nF 10% 16V 0603
2447	2238 586 59812	100nF 10% 16V 0603
2448	2238 586 59812	100nF 10% 16V 0603
2499	2238 586 59812	100nF 10% 16V 0603
2500	2238 586 59812	100nF 10% 16V 0603
2501	4822 126 14226	82pF 5% 50V 0603
2502	4822 126 14226	82pF 5% 50V 0603
2503	4822 126 14226	82pF 5% 50V 0603
2504	4822 126 14226	82pF 5% 50V 0603
2505	4822 126 14226	82pF 5% 50V 0603
2506	2238 586 59812	100nF 10% 16V 0603
2511	2238 586 59812	100nF 10% 16V 0603
2513	2238 586 59812	100nF 10% 16V 0603
2515	2238 586 59812	100nF 10% 16V 0603
2520	4822 124 23002	10µF 16V
2521	4822 124 23002	10µF 16V
2522	4822 124 23002	10µF 16V
2523	4822 124 23002	10µF 16V
2524	4822 124 23002	10µF 16V
2530	5322 124 41945	22µF 20% 35V
2531	2238 586 59812	100nF 10% 16V 0603
2533	2238 586 59812	100nF 10% 16V 0603
2534	2238 586 59812	100nF 10% 16V 0603
2535	2238 586 59812	100nF 10% 16V 0603
2537	2238 586 59812	100nF 10% 16V 0603
2538	3198 016 31020	1nF 25V 0603
2541	2238 586 59812	100nF 10% 16V 0603
2546	3198 016 31020	1nF 25V 0603
2547	3198 016 31020	1nF 25V 0603
2548	3198 016 31020	1nF 25V 0603
2550	3198 016 31020	1nF 25V 0603
2551	3198 016 31020	1nF 25V 0603

2552	3198 016 31020	1nF 25V 0603
2553	3198 016 31020	1nF 25V 0603
2554	2238 586 59812	100nF 10% 16V 0603
2555	2238 586 59812	100nF 10% 16V 0603
2557	3198 016 31020	1nF 25V 0603
2558	3198 016 31020	1nF 25V 0603
2559	3198 016 31020	1nF 25V 0603
2560	3198 016 31020	1nF 25V 0603
2562	3198 016 31020	1nF 25V 0603
2563	3198 016 31020	1nF 25V 0603
2564	3198 016 31020	1nF 25V 0603
2565	3198 016 31020	1nF 25V 0603
2566	3198 016 31020	1nF 25V 0603
2570	3198 016 31020	1nF 25V 0603
2572	2238 586 59812	100nF 10% 16V 0603
2573	4822 124 23002	10µF 16V
2574	2238 586 59812	100nF 10% 16V 0603
2581	2238 586 59812	100nF 10% 16V 0603
2583	2238 586 59812	100nF 10% 16V 0603
2584	2238 586 59812	100nF 10% 16V 0603
2600	2238 586 59812	100nF 10% 16V 0603
2601	2238 586 59812	100nF 10% 16V 0603
2602	2238 586 59812	100nF 10% 16V 0603
2603	2238 586 59812	100nF 10% 16V 0603
2604	2238 586 59812	100nF 10% 16V 0603
2605	2238 586 59812	100nF 10% 16V 0603
2606	2238 586 59812	100nF 10% 16V 0603
2607	2238 586 59812	100nF 10% 16V 0603
2608	2238 586 59812	100nF 10% 16V 0603
2609	2238 586 59812	100nF 10% 16V 0603
2610	2238 586 59812	100nF 10% 16V 0603
2611	2238 586 59812	100nF 10% 16V 0603
2612	2238 586 59812	100nF 10% 16V 0603
2613	2238 586 59812	100nF 10% 16V 0603
2614	2238 586 59812	100nF 10% 16V 0603
2615	2238 586 59812	100nF 10% 16V 0603
2616	2238 586 59812	100nF 10% 16V 0603
2617	2238 586 59812	100nF 10% 16V 0603
2618	2238 586 59812	100nF 10% 16V 0603
2619	2238 586 59812	100nF 10% 16V 0603
2620	2238 586 59812	100nF 10% 16V 0603
2621	2238 586 59812	100nF 10% 16V 0603
2622	2238 586 59812	100nF 10% 16V 0603
2623	2238 586 59812	100nF 10% 16V 0603
2624	2238 586 59812	100nF 10% 16V 0603
2625	2238 586 59812	100nF 10% 16V 0603
2628	2238 586 59812	100nF 10% 16V 0603
2629	4822 122 33741	10pF 10% 50V
2630	2238 586 59812	100nF 10% 16V 0603
2640	2238 586 59812	100nF 10% 16V 0603
2641	3198 016 31020	1nF 25V 0603
2642	4822 124 23002	10µF 16V
2643	4822 124 23002	10µF 16V
2644	4822 124 23002	10µF 16V
2645	4822 124 23002	10µF 16V
2646	4822 124 23002	10µF 16V
2647	4822 124 23002	10µF 16V
2648	4822 124 23002	10µF 16V
2649	4822 124 23002	10µF 16V
2655	2238 586 59812	100nF 10% 16V 0603
2656	2238 586 59812	100nF 10% 16V 0603
2657	2238 586 59812	100nF 10% 16V 0603
2658	2238 586 59812	100nF 10% 16V 0603
2659	2238 586 59812	100nF 10% 16V 0603
2660	2238 586 59812	100nF 10% 16V 0603
2661	2238 586 59812	100nF 10% 16V 0603
2662	2238 586 59812	100nF 10% 16V 0603
2663	2238 586 59812	100nF 10% 16V 0603
2670	2238 586 59812	100nF 10% 16V 0603
2671	2238 586 59812	100nF 10% 16V 0603
2672	2238 586 59812	100nF 10% 16V 0603
2673	2238 586 59812	100nF 10% 16V 0603
2674	2238 586 59812	100nF 10% 16V 0603
2694	3198 016 31080	1pF 50V 0603
2695	3198 016 31080	1pF 50V 0603
2696	3198 016 31080	1pF 50V 0603
2697	3198 016 31080	1pF 50V 0603
2698	3198 016 31080	1pF 50V 0603
2699	3198 016 31080	1pF 50V 0603
2711	2020 552 94427	100pF 5% 50V 0603
2712	4822 126 14472	1µF 10% 10V
2715	2238 586 59812	100nF 10% 16V 0603
2716	4822 126 11785	47pF 5% 50V 0603
2717	4822 126 14472	1µF 10% 10V
2721	2020 552 94427	100pF 5% 50V 0603
2722	4822 126 14472	1µF 10% 10V
2726	4822 126 11785	47pF 5% 50V 0603
2727	4822 126 14472	1µF 10% 10V
2731	2020 552 94427	100pF 5% 50V 0603
2732	4822 126 14472	1µF 10% 10V
2735	2238 586 59812	100nF 10% 16V 0603
2736	4822 126 11785	47pF 5% 50V 0603
2737	4822 126 14472	1µF 10% 10V
2741	2020 552 94427	100pF 5% 50V 0603
2742	4822 126 14472	1µF 10% 10V
2746	4822 126 11785	47pF 5% 50V 0603
2747	4822 126 14472	1µF 10% 10V
2751	2020 552 94427	100pF 5% 50V 0603
2752	4822 126 14472	1µF 10% 10V
2755	2238 586 59812	100nF 10% 16V 0603
2756	4822 126 11785	47pF 5% 50V 0603
2757	4822 126 14472	1µF 10% 10V
2761	2020 552 94427	100pF 5% 50V 0603
2762	4822 126 14472	1µF 10% 10V
2766	4822 126 11785	47pF 5% 50V 0603
2767	4822 126 14472	1µF 10% 10V
2771	2020 552 94427	100pF 5% 50V 0603
2772	4822 126 14472	1µF 10% 10V
2775	2020 552 94427	100pF 5% 50V 0603
2776	4822 126 14472	1µF 10% 10V
2779	2020 552 94427	100pF 5% 50V 0603
2780	4822 126 14472	1µF 10% 10V
2783	2020 552 94427	100pF 5% 50V 0603
2784	4822 126 14472	1µF 10% 10V
2787	2020 552 94427	100pF 5% 50V 0603
2788	4822 126 14472	1µF 10% 10V
2791	2020 552 94427	100pF 5% 50V 0603
2792	4822 126 14472	1µF 10% 10V
2794	4822 126 14472	1µF 10% 10V
2795	4822 126 14472	1µF 10% 10V
2796	4822 126 14472	1µF 10% 10V
2797	4822 126 14472	1µF 10% 10V
2798	2238 586 59812	100nF 10% 16V 0603
2799	5322 124 41945	22µF 20% 35V
2800	4822 124 12095	100µF 20% 16V
2801	2238 586 59812	100nF 10% 16V 0603
2802	4822 124 23002	10µF 16V
2803	4822 124 23002	10µF 16V
2804	3198 016 31020	1nF 25V 0603
2810	4822 124 12095	100µF 20% 16V
2811	3198 016 31020	1nF 25V 0603
2812	3198 016 31020	1nF 25V 0603
2813	3198 016 31020	1nF 25V 0603
2814	4822 126 14585	100nF 10% 50V
2815	3198 016 31020	1nF 25V 0603
2816	4822 124 23002	10µF 16V
2817	2238 586 59812	100nF 10% 16V 0603
2818	3198 016 31020	1nF 25V 0603
2819	3198 016 31020	1nF 25V 0603
2820	4822 124 23002	10µF 16V
2821	4822 124 23002	10µF 16V
2822	4822 126 14247	1.5nF 50V 0603
2823	4822 124 23002	10µF 16V
2824	4822 126 14247	1.5nF 50V 0603
2825	3198 016 31020	1nF 25V 0603
2826	4822 126 14472	1µF 10% 10V
2827	4822 126 14472	1µF 10% 10V
2828	3198 016 31020	1nF 25V 0603
2829	4822 124 23002	10µF 16V
2830	2238 586 59812	100nF 10% 16V 0603
2831	2238 586 59812	100nF 10% 16V 0603
2833	4822 126 14247	1.5nF 50V 0603
2834	4822 124 23002	10µF 16V
2837	4822 126 13881	470pF 5% 50V
2838	4822 126 13881	470pF 5% 50V
2839	4822 126 13881	470pF 5% 50V
2840	4822 126 11669	27pF 10% 50V
2842	2238 586 59812	100nF 10% 16V 0603
2843	4822 126 11669	27pF 10% 50V
2844	3198 016 31020	1nF 25V 0603
2845	4822 126 13883	220pF 5% 50V
2848	4822 126 11669	27pF 10% 50V
2849	3198 016 31020	1nF 25V 0603
2850	4822 126 11669	27pF 10% 50V
2852	2238 586 59812	100nF 10% 16V 0603
2853	4822 126 11669	27pF 10% 50V
2854	3198 016 31020	1nF 25V 0603
2857	3198 016 31020	1nF 25V 0603
2858	4822 126 11669	27pF 10% 50V
2861	2238 586 59812	100nF 10% 16V 0603
2862	4822 126 11785	47pF 5% 50V 0603
2863	4822 126 14472	1µF 10% 10V
2865	4822 126 11785	47pF 5% 50V 0603
2867	4822 126 13879	220nF 20% 16V
2868	4822 126 14472	1µF 10% 10V
2869	4822 126 14247	1.5nF 50V 0603
2870	2238 586 59812	100nF 10% 16V 0603
2874	2238 586 59812	100nF 10% 16V 0603
2879	4822 126 11669	27pF 10% 50V
2880	2238 586 59812	100nF 10% 16V 0603
2881	2238 586 59812	100nF 10% 16V 0603
2882	2238 586 59812	100nF 10% 16V 0603

3000	4822 051 30474	470k 5% 0.062W
3001	4822 051 30759	75Ω 5% 0.062W
3002	4822 051 30101	100Ω 5% 0.062W
3003	4822 051 30472	4k7 5% 0.062W
3004	4822 051 30474	470k 5% 0.062W
3005	4822 117 12891	220k 1%
3006	4822 051 30103	10k 5% 0.062W
3007	4822 051 30103	10k 5% 0.062W
3008	4822 051 30474	470k 5% 0.062W
3009	4822 051 30102	1k 5% 0.062W
3010	4822 051 30759	75Ω 5% 0.062W
3011	4822 051 30101	100Ω 5% 0.062W
3012	4822 051 30472	4k7 5% 0.062W
3013	4822 051 30474	470k 5% 0.062W
3014	4822 117 12891	220k 1%
3015	4822 051 30103	10k 5% 0.062W
3016	4822 051 30101	100Ω 5% 0.062W
3018	4822 051 30101	100Ω 5% 0.062W
3019	4822 051 30103	10k 5% 0.062W
3020	4822 117 13632	100k 1% 0.62W 0603
3021	4822 051 30472	4k7 5% 0.062W
3022	4822 051 30222	2k2 5% 0.062W
3023	4822 051 30223	22k 5% 0.062W
3024	4822 117 13632	100k 1% 0.62W 0603
3025	4822 051 30222	2k2 5% 0.062W
3026	4822 051 30102	1k 5% 0.062W
3030	4822 117 13632	100k 1% 0.62W 0603
3031	4822 051 30222	2k2 5% 0.062W
3032	4822 051 30223	22k 5% 0.062W
3033	4822 051 30472	4k7 5% 0.062W
3034	4822 051 30103	10k 5% 0.062W
3035	4822 051 30102	1k 5% 0.062W
3036	4822 051 30222	2k2 5% 0.062W
3040	4822 051 30332	3k3 5% 0.062W
3041	4822 051 30222	2k2 5% 0.062W
3042	4822 117 12891	220k 1%
3043	4822 051 30222	2k2 5% 0.062W
3044	4822 051 30332	3k3 5% 0.062W
3050	4822 051 30102	1k 5% 0.062W
3051	4822 051 30102	1k 5% 0.062W
3052	4822 051 30102	1k 5% 0.062W
3053	4822 051 30102	1k 5% 0.062W
3054	4822 051 30222	2k2 5% 0.062W
3060	4822 051 30103	10k 5% 0.062W
3061	4822 051 30472	4k7 5% 0.062W
3065	4822 051 30103	10k 5% 0.062W
3066	4822 051 30102	1k 5% 0.062W
3071	4822 051 30759	75Ω 5% 0.062W
3072	4822 051 30271	270Ω 5% 0.062W
3073	4822 051 30223	22k 5% 0.062W
3074	4822 051 30221	220Ω 5% 0.062W
3075	4822 051 30561	560Ω 5% 0.062W
3076	4822 051 30759	75Ω 5% 0.062W
3077	4822 051 30271	270Ω 5% 0.062W
3078	4822 051 30223	22k 5% 0.062W
3079	4822 051 30221	220Ω 5% 0.062W
3080	4822 051 30561	560Ω 5% 0.062W
3081	4822 051 30759	75Ω 5% 0.062W
3082	4822 051 30271	270Ω 5% 0.062W
3083	4822 051 30223	22k 5% 0.062W
3084	4822 051 30221	220Ω 5% 0.062W
3085	4822 051 30561	560Ω 5% 0.062W
3086	5322 117 13034	1k5 1% 0.063W 0603
3087	5322 117 13057	820Ω 1% 0.063W 0603
3088	5322 117 13057	820Ω 1% 0.063W 0603
3089	5322 117 13034	1k5 1% 0.063W 0603
3090	5322 117 13051	680Ω 1% 0.063W 0603
3091	5322 117 13047	330Ω 1% 0.063W 0603
3092	5322 117 13047	330Ω 1% 0.063W 0603
3093	5322 117 13051	680Ω 1% 0.063W 0603
3094	5322 117 13018	1k0 1% 0.063W 0603
3095	5322 117 13036	1k2 1% 0.063W 0603
3096	5322 117 13049	470Ω 1% 0.063W 0603
3097	5322 117 13062	390Ω 1% 0.063W 0603
3098	5322 117 13018	1k0 1% 0.063W 0603
3099	5322 117 13018	1k0 1% 0.063W 0603
3100	5322 117 13034	1k5 1% 0.063W 0603
3101	5322 117 13051	680Ω 1% 0.063W 0603
3102	5322 117 13046	1k8 1% 0.063W 0603
3103	5322 117 13047	330Ω 1% 0.063W 0603
3104	5322 117 13042	3k9 1% 0.063W 0603
3105	5322 117 13036	1k2 1% 0.063W 0603
3106	5322 117 13036	1k2 1% 0.063W 0603
3107	5322 117 13042	3k9 1% 0.063W 0603
3108	5322 117 13037	2k2 1% 0.063W 0603
3109	5322 117 13036	1k2 1% 0.063W 0603
3110	5322 117 13036	1k2 1% 0.063W 0603
3111	5322 117 13037	2k2 1% 0.063W 0603
3112	4822 051 30271	270Ω 5% 0.062W
3113	4822 051 30223	22k 5% 0.062W
3114	5322 117 13026	4k7 1% 0.063W 0603
3115	4822 051 30102	1k 5% 0.062W
3116	4822 051 30271	270Ω 5% 0.062W
3117	4822 051 30223	22k 5% 0.062W
3118	5322 117 13026	4k7 1% 0.063W 0603
3119	4822 051 30102	1k 5% 0.062W

3120	4822 051 30271	270Ω 5% 0.062W
3121	4822 051 30223	22k 5% 0.062W
3122	5322 117 13037	2k2 1% 0.063W 0603
3123	4822 051 30102	1k 5% 0.062W
3124	5322 117 13037	2k2 1% 0.063W 0603
3125	5322 117 13026	4k7 1% 0.063W 0603
3126	5322 117 13042	3k9 1% 0.063W 0603 RC22H
3127	5322 117 13026	4k7 1% 0.063W 0603
3128	5322 117 13026	4k7 1% 0.063W 0603
3129	4822 051 30102	1k 5% 0.062W
3130	4822 051 30102	1k 5% 0.062W
3131	4822 051 30102	1k 5% 0.062W
3132	4822 051 30221	220Ω 5% 0.062W
3133	4822 051 30101	100Ω 5% 0.062W
3134	4822 051 30271	270Ω 5% 0.062W
3135	4822 051 30223	22k 5% 0.062W
3136	4822 051 30561	560Ω 5% 0.062W
3137	4822 051 30271	270Ω 5% 0.062W
3138	4822 051 30223	22k 5% 0.062W
3139	4822 051 30561	560Ω 5% 0.062W
3140	4822 051 30271	270Ω 5% 0.062W
3141	4822 051 30223	22k 5% 0.062W
3142	4822 051 30561	560Ω 5% 0.062W
3144	4822 051 30271	270Ω 5% 0.062W
3145	4822 051 30223	22k 5% 0.062W
3146	4822 051 30561	560Ω 5% 0.062W
3147	4822 051 30271	270Ω 5% 0.062W
3148	4822 051 30223	22k 5% 0.062W
3149	4822 051 30561	560Ω 5% 0.062W
3150	4822 051 30271	270Ω 5% 0.062W
3151	4822 051 30223	22k 5% 0.062W
3152	4822 051 30561	560Ω 5% 0.062W
3153	4822 051 30271	270Ω 5% 0.062W
3154	4822 051 30223	22k 5% 0.062W
3155	4822 051 30561	560Ω 5% 0.062W
3156	4822 051 30271	270Ω 5% 0.062W
3157	4822 051 30223	22k 5% 0.062W
3158	4822 051 30561	560Ω 5% 0.062W
3159	4822 051 30271	270Ω 5% 0.062W
3160	4822 051 30223	22k 5% 0.062W
3161	4822 051 30561	560Ω 5% 0.062W
3162	4822 051 30101	100Ω 5% 0.062W
3163	4822 051 30101	100Ω 5% 0.062W
3164	4822 051 30471	470Ω 5% 0.062W
3165	4822 051 30221	220Ω 5% 0.062W
3166	4822 051 30101	100Ω 5% 0.062W
3170	4822 051 30101	100Ω 5% 0.062W
3171	4822 051 30101	100Ω 5% 0.062W
3172	4822 051 30101	100Ω 5% 0.062W
3173	4822 051 30103	10k 5% 0.062W
3174	4822 051 30102	1k 5% 0.062W
3175	4822 051 30102	1k 5% 0.062W
3176	4822 051 30103	10k 5% 0.062W
3177	4822 051 30102	1k 5% 0.062W
3178	4822 051 30103	10k 5% 0.062W
3179	4822 051 30102	1k 5% 0.062W
3180	4822 051 30102	1k 5% 0.062W
3181	4822 051 30103	10k 5% 0.062W
3182	4822 051 30103	10k 5% 0.062W
3183	4822 051 30103	10k 5% 0.062W
3184	4822 051 30103	10k 5% 0.062W
3186	4822 051 30103	10k 5% 0.062W
3188	4822 051 30221	220Ω 5% 0.062W
3189	4822 051 30221	220Ω 5% 0.062W
3190	4822 051 30221	220Ω 5% 0.062W
3200	4822 051 30101	100Ω 5% 0.062W
3203	4822 051 30101	100Ω 5% 0.062W
3204	4822 051 30101	100Ω 5% 0.062W
3205	4822 051 30101	100Ω 5% 0.062W
3206	4822 051 30102	1k 5% 0.062W
3207	4822 051 30103	10k 5% 0.062W
3208	4822 051 30332	3k3 5% 0.062W
3209	4822 051 30101	100Ω 5% 0.062W
3210	4822 051 30101	100Ω 5% 0.062W
3211	4822 051 30102	1k 5% 0.062W
3212	4822 051 30102	1k 5% 0.062W
3214	4822 051 30472	4k7 5% 0.062W
3215	4822 051 30101	100Ω 5% 0.062W
3216	4822 051 30103	10k 5% 0.062W
3217	4822 051 30101	100Ω 5% 0.062W
3218	4822 051 30472	4k7 5% 0.062W
3219	4822 117 12139	22Ω 5% 0.062W
3225	4822 051 30472	4k7 5% 0.062W
3250	4822 051 30101	100Ω 5% 0.062W
3251	4822 051 30101	100Ω 5% 0.062W
3260	4822 051 30472	4k7 5% 0.062W
3261	4822 051 30471	470Ω 5% 0.062W
3263	4822 051 30472	4k7 5% 0.062W
3271	4822 051 30101	100Ω 5% 0.062W
3274	5322 117 12534	18Ω 2% 0.1W
3275	5322 117 12534	18Ω 2% 0.1W
3276	5322 117 12534	18Ω 2% 0.1W
3277	2322 734 65609	56Ω 1% 0805
3278	2322 734 65609	56Ω 1% 0805
3279	2322 734 65609	56Ω 1% 0805
3284	4822 051 30101	100Ω 5% 0.062W
3285	4822 051 30101	100Ω 5% 0.062W
3286	3198 031 11010	4 x 100Ω 5 % 1206
3289	3198 031 11010	4 x 100Ω 5 % 1206
3290	3198 031 11010	4 x 100Ω 5 % 1206
3291	3198 031 11010	4 x 100Ω 5 % 1206
3292	3198 031 11010	4 x 100Ω 5 % 1206
3293	4822 051 30101	100Ω 5% 0.062W
3294	4822 051 30102	1k 5% 0.062W
3295	4822 051 30103	10k 5% 0.062W
3296	4822 051 30474	470k 5% 0.062W
3297	4822 051 30103	10k 5% 0.062W
3298	4822 051 30103	10k 5% 0.062W
3299	4822 051 30103	10k 5% 0.062W
3300	4822 051 30153	15k 5% 0.062W
3301	4822 051 30103	10k 5% 0.062W
3302	4822 051 30103	10k 5% 0.062W
3303	4822 051 30472	4k7 5% 0.062W
3304	4822 051 30689	68Ω 5% 0.063W 0603
3305	4822 051 30472	4k7 5% 0.062W
3306	4822 051 30153	15k 5% 0.062W
3307	4822 051 30472	4k7 5% 0.062W
3308	4822 051 30271	270Ω 5% 0.062W
3309	4822 051 30273	27k 5% 0.062W
3310	4822 051 30102	1k 5% 0.062W
3311	4822 051 30102	1k 5% 0.062W
3312	4822 117 12903	1k8 1% 0.063W 0603
3313	4822 051 30103	10k 5% 0.062W
3314	4822 117 12903	1k8 1% 0.063W 0603
3315	4822 051 30471	470Ω 5% 0.062W
3316	4822 051 30153	15k 5% 0.062W
3317	4822 051 30472	4k7 5% 0.062W
3318	4822 051 30271	270Ω 5% 0.062W
3319	4822 051 30273	27k 5% 0.062W
3320	4822 051 30102	1k 5% 0.062W
3321	4822 051 30102	1k 5% 0.062W
3322	4822 117 12903	1k8 1% 0.063W 0603
3323	4822 051 30103	10k 5% 0.062W
3324	4822 117 12903	1k8 1% 0.063W 0603
3325	4822 051 30471	470Ω 5% 0.062W
3326	4822 051 30102	1k 5% 0.062W
3327	4822 051 30103	10k 5% 0.062W
3328	4822 051 30271	270Ω 5% 0.062W
3329	4822 051 30273	27k 5% 0.062W
3330	4822 051 30102	1k 5% 0.062W
3331	4822 051 30102	1k 5% 0.062W
3332	4822 117 12903	1k8 1% 0.063W 0603
3333	4822 051 30103	10k 5% 0.062W
3334	4822 117 12903	1k8 1% 0.063W 0603
3335	4822 051 30471	470Ω 5% 0.062W
3336	4822 051 30103	10k 5% 0.062W
3337	4822 051 30103	10k 5% 0.062W
3338	4822 051 30333	33k 5% 0.062W
3339	4822 051 30103	10k 5% 0.062W
3340	4822 051 30103	10k 5% 0.062W
3344	4822 051 30472	4k7 5% 0.062W
3346	4822 051 30103	10k 5% 0.062W
3348	4822 051 30474	470k 5% 0.062W
3349	4822 051 30333	33k 5% 0.062W
3350	4822 051 30101	100Ω 5% 0.062W
3351	4822 051 30689	68Ω 5% 0.063W 0603
3352	4822 051 30103	10k 5% 0.062W
3353	4822 051 30101	100Ω 5% 0.062W
3354	4822 051 30101	100Ω 5% 0.062W
3355	4822 051 30103	10k 5% 0.062W
3356	4822 051 30103	10k 5% 0.062W
3357	4822 051 30103	10k 5% 0.062W
3358	4822 051 30472	4k7 5% 0.062W
3359	4822 051 30689	68Ω 5% 0.063W 0603
3363	4822 051 30472	4k7 5% 0.062W
3364	4822 117 12925	47k 1% 0.063W 0603
3365	4822 051 30474	470k 5% 0.062W
3366	4822 051 30102	1k 5% 0.062W
3367	4822 051 30103	10k 5% 0.062W
3368	4822 051 30103	10k 5% 0.062W
3369	4822 051 30472	4k7 5% 0.062W
3370	4822 051 30474	470k 5% 0.062W
3371	4822 051 30101	100Ω 5% 0.062W
3372	4822 051 30103	10k 5% 0.062W
3373	4822 051 30222	2k2 5% 0.062W
3375	4822 117 13632	100k 1% 0.62W 0603
3376	4822 051 30472	4k7 5% 0.062W
3377	4822 051 30101	100Ω 5% 0.062W
3379	4822 051 30222	2k2 5% 0.062W
3380	3198 031 11010	4 x 100Ω 5 % 1206
3381	3198 031 11010	4 x 100Ω 5 % 1206
3382	3198 031 11010	4 x 100Ω 5 % 1206
3383	3198 031 11010	4 x 100Ω 5 % 1206
3384	4822 051 30101	100Ω 5% 0.062W
3385	4822 051 30102	1k 5% 0.062W
3386	4822 051 30222	2k2 5% 0.062W
3387	4822 051 30102	1k 5% 0.062W
3388	4822 051 30102	1k 5% 0.062W
3389	4822 051 30101	100Ω 5% 0.062W
3390	4822 051 30102	1k 5% 0.062W
3391	4822 051 30333	33k 5% 0.062W
3392	4822 051 30101	100Ω 5% 0.062W
3393	4822 051 30102	1k 5% 0.062W
3394	4822 051 30222	2k2 5% 0.062W
3398	3198 031 11010	4 x 100Ω 5 % 1206
3400	4822 051 30222	2k2 5% 0.062W
3400	4822 051 30472	4k7 5% 0.062W
3402	3198 031 11010	4 x 100Ω 5 % 1206
3404	3198 031 11010	4 x 100Ω 5 % 1206
3405	4822 051 30332	3k3 5% 0.062W
3406	3198 031 11010	4 x 100Ω 5 % 1206
3410	4822 051 30222	2k2 5% 0.062W
3411	4822 051 30332	3k3 5% 0.062W
3413	4822 051 30222	2k2 5% 0.062W
3414	4822 051 30472	4k7 5% 0.062W
3415	4822 051 30472	4k7 5% 0.062W
3417	4822 051 30221	220Ω 5% 0.062W
3418	4822 051 30102	1k 5% 0.062W
3419	4822 051 30392	3k9 5% 0.063W 0603
3420	4822 051 30222	2k2 5% 0.062W
3421	4822 051 30102	1k 5% 0.062W
3422	4822 051 30152	1k5 5% 0.062W
3423	4822 051 30103	10k 5% 0.062W
3424	4822 051 30332	3k3 5% 0.062W
3426	4822 051 30332	3k3 5% 0.062W
3428	4822 051 30101	100Ω 5% 0.062W
3429	4822 051 30101	100Ω 5% 0.062W
3430	4822 051 30472	4k7 5% 0.062W
3431	4822 051 30101	100Ω 5% 0.062W
3432	4822 051 30472	4k7 5% 0.062W
3433	4822 051 30101	100Ω 5% 0.062W
3435	4822 051 30273	27k 5% 0.062W
3436	4822 117 12891	220k 1%
3448	3198 031 11010	4 x 100Ω 5 % 1206
3449	3198 031 11010	4 x 100Ω 5 % 1206
3450	4822 051 30101	100Ω 5% 0.062W
3451	3198 031 11010	4 x 100Ω 5 % 1206
3452	3198 031 11010	4 x 100Ω 5 % 1206
3453	3198 031 11010	4 x 100Ω 5 % 1206
3460	3198 031 11010	4 x 100Ω 5 % 1206
3461	3198 031 11010	4 x 100Ω 5 % 1206
3462	3198 031 11010	4 x 100Ω 5 % 1206
3463	3198 031 11010	4 x 100Ω 5 % 1206
3464	3198 031 11010	4 x 100Ω 5 % 1206
3483	4822 051 30471	470Ω 5% 0.062W
3485	4822 051 30151	150Ω 5% 0.062W
3486	4822 051 30151	150Ω 5% 0.062W
3487	4822 051 30151	150Ω 5% 0.062W
3488	4822 051 30222	2k2 5% 0.062W
3489	4822 051 30222	2k2 5% 0.062W
3490	4822 051 30102	1k 5% 0.062W
3494	3198 031 14710	4 x 470Ω 5 % 1206
3496	4822 051 30103	10k 5% 0.062W
3502	4822 051 30008	Jumper 0603
3506	4822 051 30332	3k3 5% 0.062W
3507	4822 051 30472	4k7 5% 0.062W
3510	4822 051 30102	1k 5% 0.062W
3511	4822 051 30222	2k2 5% 0.062W
3512	4822 051 30562	5k6 5% 0.063W 0603
3513	4822 051 30332	3k3 5% 0.062W
3514	4822 051 30472	4k7 5% 0.062W
3515	4822 117 12925	47k 1% 0.063W 0603
3516	4822 117 12925	47k 1% 0.063W 0603
3517	4822 051 30102	1k 5% 0.062W
3518	4822 117 13632	100k 1% 0.62W 0603
3519	4822 051 30222	2k2 5% 0.062W
3520	4822 051 30222	2k2 5% 0.062W
3530	4822 051 30101	100Ω 5% 0.062W
3531	4822 051 30101	100Ω 5% 0.062W
3532	4822 051 30101	100Ω 5% 0.062W
3536	5322 117 13037	2k2 1% 0.063W 0603
3540	4822 051 30101	100Ω 5% 0.062W
3541	4822 051 30101	100Ω 5% 0.062W
3545	4822 051 30008	Jumper 0603
3547	4822 051 30102	1k 5% 0.062W
3548	4822 051 30102	1k 5% 0.062W
3550	4822 051 30101	100Ω 5% 0.062W
3551	4822 051 30101	100Ω 5% 0.062W
3552	4822 051 30101	100Ω 5% 0.062W
3553	4822 051 30101	100Ω 5% 0.062W
3556	4822 051 30222	2k2 5% 0.062W
3557	4822 051 30101	100Ω 5% 0.062W
3558	4822 051 30101	100Ω 5% 0.062W
3559	4822 051 30101	100Ω 5% 0.062W
3560	4822 051 30101	100Ω 5% 0.062W
3562	4822 051 30103	10k 5% 0.062W
3563	4822 051 30008	Jumper 0603
3564	4822 051 30101	100Ω 5% 0.062W
3565	4822 051 30101	100Ω 5% 0.062W
3566	4822 051 30103	10k 5% 0.062W
3567	4822 051 30103	10k 5% 0.062W
3568	4822 051 30008	Jumper 0603

3570	4822 051 30332	3k3 5% 0.062W
3571	4822 051 30101	100Ω 5% 0.062W
3572	4822 051 30008	Jumper 0603
3575	4822 051 30102	1k 5% 0.062W
3580	4822 051 30472	4k7 5% 0.062W
3581	4822 051 30101	100Ω 5% 0.062W
3582	4822 051 30101	100Ω 5% 0.062W
3583	4822 051 30472	4k7 5% 0.062W
3590	4822 051 30332	3k3 5% 0.062W
3591	4822 051 30332	3k3 5% 0.062W
3592	4822 051 30332	3k3 5% 0.062W
3593	4822 051 30332	3k3 5% 0.062W
3594	4822 051 30472	4k7 5% 0.062W
3600	4822 051 30332	3k3 5% 0.062W
3601	4822 051 30332	3k3 5% 0.062W
3602	4822 051 30101	100Ω 5% 0.062W
3603	4822 051 30101	100Ω 5% 0.062W
3604	4822 051 30101	100Ω 5% 0.062W
3605	4822 051 30101	100Ω 5% 0.062W
3606	4822 051 30101	100Ω 5% 0.062W
3607	4822 051 30101	100Ω 5% 0.062W
3608	4822 051 30101	100Ω 5% 0.062W
3609	4822 051 30101	100Ω 5% 0.062W
3610	4822 051 30479	47Ω 5% 0.062W
3611	4822 051 30101	100Ω 5% 0.062W
3612	4822 051 30332	3k3 5% 0.062W
3613	4822 051 30332	3k3 5% 0.062W
3615	4822 051 30101	100Ω 5% 0.062W
3616	4822 051 30102	1k 5% 0.062W
3617	4822 051 30102	1k 5% 0.062W
3620	4822 051 30103	10k 5% 0.062W
3621	4822 051 30103	10k 5% 0.062W
3622	4822 051 30479	47Ω 5% 0.062W
3623	4822 051 30102	1k 5% 0.062W
3625	4822 051 30332	3k3 5% 0.062W
3626	4822 051 30332	3k3 5% 0.062W
3627	4822 051 30332	3k3 5% 0.062W
3628	4822 051 30101	100Ω 5% 0.062W
3630	4822 051 30102	1k 5% 0.062W
3632	4822 051 30332	3k3 5% 0.062W
3633	4822 051 30472	4k7 5% 0.062W
3634	4822 051 30332	3k3 5% 0.062W
3636	4822 051 30332	3k3 5% 0.062W
3637	4822 051 30102	1k 5% 0.062W
3638	4822 051 30102	1k 5% 0.062W
3639	4822 051 30102	1k 5% 0.062W
3640	4822 051 30222	2k2 5% 0.062W
3641	4822 051 30102	1k 5% 0.062W
3653	4822 051 30102	1k 5% 0.062W
3654	4822 051 30102	1k 5% 0.062W
3655	4822 051 30102	1k 5% 0.062W
3657	4822 051 30103	10k 5% 0.062W
3658	4822 051 30103	10k 5% 0.062W
3660	4822 051 30101	100Ω 5% 0.062W
3661	4822 051 30101	100Ω 5% 0.062W
3662	4822 051 30101	100Ω 5% 0.062W
3663	4822 051 30101	100Ω 5% 0.062W
3664	4822 051 30101	100Ω 5% 0.062W
3665	4822 051 30101	100Ω 5% 0.062W
3667	4822 051 30101	100Ω 5% 0.062W
3668	4822 051 30101	100Ω 5% 0.062W
3673	4822 051 30103	10k 5% 0.062W
3674	4822 051 30101	100Ω 5% 0.062W
3675	4822 051 30103	10k 5% 0.062W
3676	4822 051 30101	100Ω 5% 0.062W
3677	4822 051 30101	100Ω 5% 0.062W
3679	4822 051 30101	100Ω 5% 0.062W
3681	4822 051 30332	3k3 5% 0.062W
3682	4822 051 30471	470Ω 5% 0.062W
3685	4822 051 30332	3k3 5% 0.062W
3686	4822 051 30471	470Ω 5% 0.062W
3688	4822 051 30471	470Ω 5% 0.062W
3689	4822 051 30471	470Ω 5% 0.062W
3710	4822 051 30333	33k 5% 0.062W
3711	4822 051 30102	1k 5% 0.062W
3713	4822 051 30101	100Ω 5% 0.062W
3714	4822 051 30223	22k 5% 0.062W
3716	4822 051 30153	15k 5% 0.062W
3717	4822 051 30333	33k 5% 0.062W
3718	4822 051 30103	10k 5% 0.062W
3719	4822 051 30333	33k 5% 0.062W
3720	4822 051 30333	33k 5% 0.062W
3721	4822 051 30102	1k 5% 0.062W
3723	4822 051 30101	100Ω 5% 0.062W
3724	4822 051 30223	22k 5% 0.062W
3726	4822 051 30153	15k 5% 0.062W
3730	4822 051 30333	33k 5% 0.062W
3731	4822 051 30331	330Ω 5% 0.062W
3733	4822 051 30101	100Ω 5% 0.062W
3734	4822 051 30223	22k 5% 0.062W
3736	4822 051 30153	15k 5% 0.062W
3740	4822 051 30333	33k 5% 0.062W
3741	4822 051 30331	330Ω 5% 0.062W
3743	4822 051 30101	100Ω 5% 0.062W
3744	4822 051 30223	22k 5% 0.062W
3746	4822 051 30153	15k 5% 0.062W
3750	4822 051 30333	33k 5% 0.062W
3751	4822 051 30102	1k 5% 0.062W
3753	4822 051 30101	100Ω 5% 0.062W
3754	4822 051 30223	22k 5% 0.062W
3756	4822 051 30153	15k 5% 0.062W
3760	4822 051 30333	33k 5% 0.062W
3761	4822 051 30102	1k 5% 0.062W
3763	4822 051 30101	100Ω 5% 0.062W
3764	4822 051 30223	22k 5% 0.062W
3766	4822 051 30153	15k 5% 0.062W
3771	4822 051 30102	1k 5% 0.062W
3772	4822 051 30332	3k3 5% 0.062W
3773	4822 051 30103	10k 5% 0.062W
3775	4822 051 30102	1k 5% 0.062W
3776	4822 051 30332	3k3 5% 0.062W
3777	4822 051 30103	10k 5% 0.062W
3779	4822 051 30102	1k 5% 0.062W
3780	4822 051 30332	3k3 5% 0.062W
3781	4822 051 30103	10k 5% 0.062W
3783	4822 051 30102	1k 5% 0.062W
3784	4822 051 30332	3k3 5% 0.062W
3785	4822 051 30103	10k 5% 0.062W
3787	4822 051 30102	1k 5% 0.062W
3788	4822 051 30332	3k3 5% 0.062W
3789	4822 051 30103	10k 5% 0.062W
3791	4822 051 30102	1k 5% 0.062W
3792	4822 051 30332	3k3 5% 0.062W
3793	4822 051 30103	10k 5% 0.062W
3794	4822 051 30101	100Ω 5% 0.062W
3795	4822 051 30101	100Ω 5% 0.062W
3796	4822 051 30472	4k7 5% 0.062W
3797	4822 051 30472	4k7 5% 0.062W
3798	4822 051 30333	33k 5% 0.062W
3800	4822 051 30331	330Ω 5% 0.062W
3801	4822 051 30331	330Ω 5% 0.062W
3802	4822 051 30333	33k 5% 0.062W
3803	4822 117 13632	100k 1% 0.62W 0603
3804	4822 051 30333	33k 5% 0.062W
3805	4822 117 13632	100k 1% 0.62W 0603
3806	4822 117 13632	100k 1% 0.62W 0603
3807	4822 117 13632	100k 1% 0.62W 0603
3808	4822 117 13632	100k 1% 0.62W 0603
3809	4822 051 30333	33k 5% 0.062W
3810	4822 051 30472	4k7 5% 0.062W
3811	4822 051 30472	4k7 5% 0.062W
3812	4822 051 30101	100Ω 5% 0.062W
3813	4822 051 30101	100Ω 5% 0.062W
3815	4822 051 30101	100Ω 5% 0.062W
3816	4822 051 30101	100Ω 5% 0.062W
3817	4822 051 30101	100Ω 5% 0.062W
3818	4822 051 30101	100Ω 5% 0.062W
3820	4822 051 30333	33k 5% 0.062W
3821	4822 051 30103	10k 5% 0.062W
3822	4822 051 30333	33k 5% 0.062W
3836	4822 117 13632	100k 1% 0.62W 0603
3837	4822 117 13632	100k 1% 0.62W 0603
3840	4822 051 30223	22k 5% 0.062W
3841	4822 051 30223	22k 5% 0.062W
3843	4822 051 30393	39k 5% 0.062W
3844	4822 051 30101	100Ω 5% 0.062W
3845	4822 051 30101	100Ω 5% 0.062W
3846	4822 051 30223	22k 5% 0.062W
3847	4822 051 30393	39k 5% 0.062W
3848	4822 051 30393	39k 5% 0.062W
3849	4822 051 30101	100Ω 5% 0.062W
3850	4822 051 30223	22k 5% 0.062W
3851	4822 051 30223	22k 5% 0.062W
3853	4822 051 30393	39k 5% 0.062W
3854	4822 051 30101	100Ω 5% 0.062W
3855	4822 051 30101	100Ω 5% 0.062W
3856	4822 051 30223	22k 5% 0.062W
3857	4822 051 30393	39k 5% 0.062W
3858	4822 051 30393	39k 5% 0.062W
3859	4822 051 30101	100Ω 5% 0.062W
3860	4822 117 12902	8k2 1% 0.063W 0603
3861	4822 051 30223	22k 5% 0.062W
3862	4822 051 30273	27k 5% 0.062W
3863	4822 117 12902	8k2 1% 0.063W 0603
3864	4822 051 30223	22k 5% 0.062W
3865	4822 051 30273	27k 5% 0.062W
3866	4822 051 30101	100Ω 5% 0.062W
3867	4822 051 30101	100Ω 5% 0.062W
3870	4822 051 30101	100Ω 5% 0.062W
3879	4822 117 12925	47k 1% 0.063W 0603
3880	4822 051 30471	470Ω 5% 0.062W
3900	4822 051 30472	4k7 5% 0.062W
3901	4822 051 30333	33k 5% 0.062W
3902	4822 051 30471	470Ω 5% 0.062W
3903	4822 051 30471	470Ω 5% 0.062W
3904	4822 051 30471	470Ω 5% 0.062W
3905	4822 051 30103	10k 5% 0.062W
3906	4822 051 30103	10k 5% 0.062W
3907	4822 051 30103	10k 5% 0.062W
3908	4822 051 30103	10k 5% 0.062W
3909	4822 051 30152	1k5 5% 0.062W
3910	4822 051 30102	1k 5% 0.062W
3911	4822 117 12925	47k 1% 0.063W 0603
3912	4822 051 30472	4k7 5% 0.062W
3913	4822 051 30101	100Ω 5% 0.062W
3917	4822 051 30472	4k7 5% 0.062W
3918	4822 051 30102	1k 5% 0.062W
3919	4822 051 30102	1k 5% 0.062W
3922	4822 051 30102	1k 5% 0.062W
3923	4822 051 30472	4k7 5% 0.062W
3924	4822 051 30331	330Ω 5% 0.062W
3925	4822 051 30331	330Ω 5% 0.062W
3926	4822 051 30331	330Ω 5% 0.062W
3927	4822 051 30331	330Ω 5% 0.062W
3928	4822 051 30331	330Ω 5% 0.062W

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5000	2422 549 43769	Bead 100MHz 30Ω
5007	2422 549 43769	Bead 100MHz 30Ω
5009	2422 549 43769	Bead 100MHz 30Ω
5020	2422 549 43769	Bead 100MHz 30Ω
5060	2422 549 43769	Bead 100MHz 30Ω
5089	2422 549 43062	Bead 100MHz 600Ω
5140	2422 549 43062	Bead 100MHz 600Ω
5160	2422 549 43062	Bead 100MHz 600Ω
5161	2422 549 43062	Bead 100MHz 600Ω
5162	2422 549 43062	Bead 100MHz 600Ω
5164	2422 549 43062	Bead 100MHz 600Ω
5166	2422 549 43769	Bead 100MHz 30Ω
5170	2422 549 43769	Bead 100MHz 30Ω
5175	2422 549 43062	Bead 100MHz 600Ω
5180	2422 549 43062	Bead 100MHz 600Ω
5196	2422 549 43062	Bead 100MHz 600Ω
5197	2422 549 43769	Bead 100MHz 30Ω
5198	2422 549 43062	Bead 100MHz 600Ω
5199	2422 549 43062	Bead 100MHz 600Ω
5210	2422 549 43062	Bead 100MHz 600Ω
5214	2422 549 43062	Bead 100MHz 600Ω
5220	2422 549 43062	Bead 100MHz 600Ω
5221	2422 549 43062	Bead 100MHz 600Ω
5222	2422 549 43062	Bead 100MHz 600Ω
5223	2422 549 43062	Bead 100MHz 600Ω
5224	2422 549 43062	Bead 100MHz 600Ω
5228	2422 549 43062	Bead 100MHz 600Ω
5300	2422 549 43062	Bead 100MHz 600Ω
5302	2422 549 43062	Bead 100MHz 600Ω
5352	2422 549 43769	Bead 100MHz 30Ω
5520	2422 549 43062	Bead 100MHz 600Ω
5521	2422 549 43062	Bead 100MHz 600Ω
5522	2422 549 43062	Bead 100MHz 600Ω
5523	2422 549 43062	Bead 100MHz 600Ω
5524	2422 549 43062	Bead 100MHz 600Ω
5530	2422 549 43769	Bead 100MHz 30Ω
5541	2422 549 43062	Bead 100MHz 600Ω
5570	3198 018 51090	10µH 10% 0603
5572	2422 549 43769	Bead 100MHz 30Ω
5574	2422 549 43062	Bead 100MHz 600Ω
5628	2422 549 43062	Bead 100MHz 600Ω
5630	2422 549 43062	Bead 100MHz 600Ω
5642	2422 549 43062	Bead 100MHz 600Ω
5643	2422 549 43062	Bead 100MHz 600Ω
5644	2422 549 43062	Bead 100MHz 600Ω
5645	2422 549 43062	Bead 100MHz 600Ω
5646	2422 549 43062	Bead 100MHz 600Ω
5647	2422 549 43062	Bead 100MHz 600Ω
5648	2422 549 43062	Bead 100MHz 600Ω
5649	2422 549 43062	Bead 100MHz 600Ω
5670	2422 549 43062	Bead 100MHz 600Ω
5672	2422 549 43062	Bead 100MHz 600Ω
5673	2422 549 43062	Bead 100MHz 600Ω
5796	2422 549 43062	Bead 100MHz 600Ω
5798	2422 549 43062	Bead 100MHz 600Ω
5810	2422 549 43062	Bead 100MHz 600Ω
5820	2422 549 43062	Bead 100MHz 600Ω
5822	2422 549 43769	Bead 100MHz 30Ω
5834	2422 549 43769	Bead 100MHz 30Ω
5870	2422 549 43769	Bead 100MHz 30Ω

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6001	9322 149 10685	BZM55-C33
6007	9322 149 96685	BZX384-C2V4
6010	9322 149 10685	BZM55-C33
6019	9322 149 96685	BZX384-C2V4
6022	4822 130 10654	BAT254
6034	4822 130 10654	BAT254
6071	9322 149 10685	BZM55-C33
6076	9322 149 10685	BZM55-C33
6091	9322 149 10685	BZM55-C33

6105	9322 149 96685	BZX384-C2V4
6166	9322 149 96685	BZX384-C2V4
6200	4822 130 10328	BAV99W
6201	4822 130 10328	BAV99W
6202	4822 130 10328	BAV99W
6203	4822 130 10328	BAV99W
6204	4822 130 10328	BAV99W
6205	4822 130 10328	BAV99W
6206	4822 130 10328	BAV99W
6207	4822 130 10328	BAV99W
6208	4822 130 10328	BAV99W
6209	4822 130 10328	BAV99W
6210	4822 130 83757	MCL4148
6214	4822 130 83757	MCL4148
6274	9322 149 10685	BZM55-C33
6276	9322 149 10685	BZM55-C33
6277	9322 149 10685	BZM55-C33
6278	9322 149 10685	BZM55-C33
6302	4822 130 10654	BAT254
6310	4822 130 10654	BAT254
6311	4822 130 10654	BAT254
6315	9322 149 10685	BZM55-C33
6315	9340 548 71115	PDZ33B
6316	9322 149 10685	BZM55-C33
6316	9340 548 71115	PDZ33B
6317	9322 149 10685	BZM55-C33
6317	9340 548 71115	PDZ33B
6318	9322 149 10685	BZM55-C33
6318	9340 548 71115	PDZ33B
6319	9322 149 10685	BZM55-C33
6319	9340 548 71115	PDZ33B
6320	9322 149 10685	BZM55-C33
6320	9340 548 71115	PDZ33B
6321	9322 149 10685	BZM55-C33
6321	9340 548 71115	PDZ33B
6322	9322 149 10685	BZM55-C33
6322	9340 548 71115	PDZ33B
6323	9322 149 10685	BZM55-C33
6323	9340 548 71115	PDZ33B
6324	9322 149 10685	BZM55-C33
6324	9340 548 71115	PDZ33B
6354	9322 149 10685	BZM55-C33
6354	9340 548 71115	PDZ33B
6355	9322 149 10685	BZM55-C33
6355	9340 548 71115	PDZ33B
6356	9322 149 10685	BZM55-C33
6356	9340 548 71115	PDZ33B
6357	9322 149 10685	BZM55-C33
6357	9340 548 71115	PDZ33B
6365	9322 129 38685	BZM55-C6V8
6366	4822 130 10654	BAT254
6378	4822 130 83757	MCL4148
6380	4822 130 10654	BAT254
6381	4822 130 10654	BAT254
6388	4822 130 11422	PLVA2650A
6393	4822 130 11422	PLVA2650A
6399	4822 130 11422	PLVA2650A
6503	9322 149 96685	BZX384-C2V4
6507	4822 130 10654	BAT254
6508	4822 130 10654	BAT254
6509	4822 130 10654	BAT254
6551	4822 130 10328	BAV99W
6552	4822 130 10328	BAV99W
6553	4822 130 10328	BAV99W
6554	4822 130 10328	BAV99W
6555	4822 130 10328	BAV99W
6630	4822 130 10654	BAT254
6710	9322 149 10685	BZM55-C33
6710	9340 548 71115	PDZ33B
6711	9322 149 10685	BZM55-C33
6711	9340 548 71115	PDZ33B
6720	9322 149 10685	BZM55-C33
6720	9340 548 71115	PDZ33B
6721	9322 149 10685	BZM55-C33
6721	9340 548 71115	PDZ33B
6730	9322 149 10685	BZM55-C33
6730	9340 548 71115	PDZ33B
6731	9322 149 10685	BZM55-C33
6731	9340 548 71115	PDZ33B
6740	9322 149 10685	BZM55-C33
6740	9340 548 71115	PDZ33B
6741	9322 149 10685	BZM55-C33
6741	9340 548 71115	PDZ33B
6750	9322 149 10685	BZM55-C33
6751	9322 149 10685	BZM55-C33
6760	9322 149 10685	BZM55-C33
6761	9322 149 10685	BZM55-C33
6770	9322 149 10685	BZM55-C33
6771	9322 149 10685	BZM55-C33
6774	9322 149 10685	BZM55-C33
6775	9322 149 10685	BZM55-C33
6778	9322 149 10685	BZM55-C33
6779	9322 149 10685	BZM55-C33
6782	9322 149 10685	BZM55-C33
6783	9322 149 10685	BZM55-C33
6786	9322 149 10685	BZM55-C33
6787	9322 149 10685	BZM55-C33
6790	9322 149 10685	BZM55-C33
6791	9322 149 10685	BZM55-C33
6802	9340 260 20115	BAW56W
6805	9340 260 20115	BAW56W
6807	9340 260 20115	BAW56W
6820	4822 130 10654	BAT254
6821	4822 130 11422	PLVA2650A

7000	3198 010 42310	BC847BW
7001	3198 010 42310	BC847BW
7002	3198 010 42310	BC847BW
7006	3198 010 42310	BC847BW
7007	5322 209 11598	PC74HCT4538T
7009	9337 153 10118	74HCT4052D
7010	3198 010 42310	BC847BW
7025	4822 209 30732	LM319D
7040	4822 209 60767	LM1881M
7041	3198 010 42310	BC847BW
7060	3198 010 42310	BC847BW
7065	3198 010 42310	BC847BW
7074	3198 010 42310	BC847BW
7075	3198 010 42320	BC857BW
7079	3198 010 42310	BC847BW
7080	3198 010 42320	BC857BW
7084	3198 010 42310	BC847BW
7085	3198 010 42320	BC857BW
7088	9322 145 66668	TSH93ID
7089	4822 209 60792	74HC4053D
7090	9322 145 66668	TSH93ID
7100	4822 209 60792	74HC4053D
7102	3198 010 42310	BC847BW
7103	3198 010 42310	BC847BW
7104	3198 010 42310	BC847BW
7105	3198 010 42310	BC847BW
7107	4822 209 73852	PMBT2369
7110	3198 010 42310	BC847BW
7111	3198 010 42310	BC847BW
7112	3198 010 42310	BC847BW
7113	3198 010 42310	BC847BW
7115	4822 209 73852	PMBT2369
7117	3198 010 42310	BC847BW
7121	3198 010 42310	BC847BW
7129	3198 010 42310	BC847BW
7130	3198 010 42310	BC847BW
7131	3198 010 42310	BC847BW
7135	3198 010 42310	BC847BW
7138	3198 010 42310	BC847BW
7141	3198 010 42310	BC847BW
7145	3198 010 42310	BC847BW
7146	9337 153 10118	74HCT4052D
7148	3198 010 42310	BC847BW
7151	3198 010 42310	BC847BW
7154	3198 010 42310	BC847BW
7157	3198 010 42310	BC847BW
7158	9337 153 10118	74HCT4052D
7160	3198 010 42310	BC847BW
7165	3198 010 42310	BC847BW
7170	9322 160 96671	AD9887KS-140
7175	4822 209 17398	LD1117DT33
7215	9322 046 99668	ST24FC21M6
7225	9352 673 95518	SAA7118E/V1
7280	9322 158 95668	SDA9400
7303	4822 209 30212	PC74HCT125T
7305	3198 010 42310	BC847BW
7306	3198 010 42310	BC847BW
7307	3198 010 42310	BC847BW
7308	3198 010 42310	BC847BW
7309	3198 010 42310	BC847BW
7310	3198 010 42310	BC847BW
7311	9322 145 66668	TSH93ID
7315	3198 010 42310	BC847BW
7316	3198 010 42310	BC847BW
7318	3198 010 42310	BC847BW
7319	3198 010 42310	BC847BW
7320	3198 010 42310	BC847BW
7321	3198 010 42310	BC847BW
7322	3198 010 42310	BC847BW
7323	3198 010 42310	BC847BW
7325	3198 010 42310	BC847BW
7326	3198 010 42310	BC847BW
7328	3198 010 42310	BC847BW
7333	3198 010 42310	BC847BW
7340	9337 153 10118	74HCT4052D
7352	9322 160 17668	IC SM ST202ECD (ST00) R
7356	3198 010 42310	BC847BW
7357	3198 010 42310	BC847BW
7358	3198 010 42310	BC847BW
7364	4822 130 61553	DTC124EU
7365	3198 010 42310	BC847BW
7366	3198 010 42310	BC847BW
7367	3198 010 42310	BC847BW
7370	4822 209 71585	74HCT4538N
7383	9352 684 81557	IC SM SAA5801H/015 (PHSE) Y
7405	3198 010 42310	BC847BW
7406	3198 010 42310	BC847BW
7430	9322 156 81668	M24C32-WMN6TNKSA
7435	3198 010 42310	BC847BW
7500	9322 157 20668	MSM51V18165F-60J
7506	9322 168 18668	AM29DL164DT-70EI
7510	9352 499 60118	74LVC00AD
7515	3198 010 42310	BC847BW
7516	3198 010 42320	BC857BW
7517	9322 158 67685	ADM810TART
7530	4822 209 90188	PCF8591T
7540	5322 209 33172	PCF8574AT
7550	5322 209 11598	PC74HCT4538T
7555	5322 209 11598	PC74HCT4538T
7563	3198 010 42310	BC847BW
7570	9322 137 99668	FS6377-01
7571	5322 209 11598	PC74HCT4538T
7574	9352 317 00118	74LVC125AD
7580	9322 156 81668	M24C32-WMN6TNKSA
7605	3122 357 00274	Software FM23GB-1.3-00274
7628	9322 164 75682	CY62126BVLL-70ZI
7630	3122 357 00264	Software FM23GB-1.3-00264
7640	4822 209 16406	TL431ACD
7641	9322 157 95668	STD16NE06L
7655	3122 357 00285	Software FM23GB2400285
7656	9322 165 40671	EP1K30FC256-3
7656	9322 186 23671	EP1K50FC256-3
7670	9322 159 45668	DS90C385MTD
7675	9340 560 36235	BSH111
7676	9340 560 36235	BSH111
7714	4822 209 30095	LM833D
7718	3198 010 42310	BC847BW
7734	4822 209 30095	LM833D
7754	4822 209 30095	LM833D
7798	9322 116 87668	TEA6422D
7800	4822 209 60792	74HC4053D
7801	3198 010 42310	BC847BW
7802	3198 010 42310	BC847BW
7803	3198 010 42320	BC857BW
7805	9340 547 13215	BSH103
7806	9340 547 13215	BSH103
7807	9340 547 13215	BSH103
7808	9340 547 13215	BSH103
7812	9322 167 63668	IC SM MSP3415G-QG-B8
7841	4822 209 30095	LM833D
7851	4822 209 30095	LM833D
7861	9322 173 77668	TS462CD
7870	9322 167 76668	TC74HC590AF
7874	9322 167 76668	TC74HC590AF
7879	3198 010 42310	BC847BW
7880	9322 153 66668	CY7C199-15ZC
7881	9351 869 80118	74HCT573DB
7882	9351 869 80118	74HCT573DB

VGA Panel [VGA]

Various

0318	2422 025 17183	32P female hor. 1.00
0371	4822 267 51477	15P female Sub-D
0372	4822 267 51477	15P female Sub-D
0374	2422 026 05276	Socket 1 x cinch

2901	2238 586 59812	100nF 10% 16V 0603
2902	2238 586 59812	100nF 10% 16V 0603
2909	2238 586 59812	100nF 10% 16V 0603
2910	2238 586 59812	100nF 10% 16V 0603
2925	2020 552 94427	100pF 5% 50V 0603

3900	4822 051 30331	330Ω 5% 0.062W
3901	4822 051 30331	330Ω 5% 0.062W
3902	4822 051 30331	330Ω 5% 0.062W
3903	4822 051 30101	100Ω 5% 0.062W
3904	4822 051 30103	10k 5% 0.062W
3905	4822 051 30103	10k 5% 0.062W
3906	4822 051 30101	100Ω 5% 0.062W
3907	4822 051 30101	100Ω 5% 0.062W
3908	4822 051 30101	100Ω 5% 0.062W
3909	4822 051 30101	100Ω 5% 0.062W

3910	4822 051 30103	10k 5% 0.062W
3911	4822 051 30101	100Ω 5% 0.062W
3912	4822 051 30102	1k 5% 0.062W
3913	4822 051 30101	100Ω 5% 0.062W
3914	4822 051 30102	1k 5% 0.062W
3915	4822 051 30101	100Ω 5% 0.062W
3916	4822 051 30101	100Ω 5% 0.062W
3917	4822 051 30103	10k 5% 0.062W
3918	4822 051 30103	10k 5% 0.062W
3919	4822 051 30101	100Ω 5% 0.062W
3920	4822 051 30101	100Ω 5% 0.062W
3921	4822 051 30103	10k 5% 0.062W
3922	4822 051 30101	100Ω 5% 0.062W
3923	4822 051 30102	1k 5% 0.062W
3924	4822 051 30101	100Ω 5% 0.062W
3925	4822 051 30102	1k 5% 0.062W
3926	4822 051 30101	100Ω 5% 0.062W
3927	4822 051 30472	4k7 5% 0.062W
3929	4822 051 30472	4k7 5% 0.062W
3930	4822 051 30472	4k7 5% 0.062W
3934	4822 051 30103	10k 5% 0.062W
3935	4822 051 30333	33k 5% 0.062W
3999	4822 051 30152	1k5 5% 0.062W

5900	2422 549 43062	Bead 100MHz 600Ω
5901	2422 549 43062	Bead 100MHz 600Ω

6900	9322 149 10685	BZM55-C33
6901	9322 149 10685	BZM55-C33
6902	9322 149 10685	BZM55-C33
6903	9322 149 10685	BZM55-C33
6904	4822 130 10654	BAT254
6905	4822 130 10654	BAT254
6906	9322 149 10685	BZM55-C33
6907	9322 149 10685	BZM55-C33
6908	9322 149 10685	BZM55-C33
6909	9322 149 10685	BZM55-C33
6910	9322 149 10685	BZM55-C33
6911	9322 149 10685	BZM55-C33
6912	9322 149 10685	BZM55-C33
6913	9322 149 10685	BZM55-C33
6914	9322 149 10685	BZM55-C33
6915	9322 149 10685	BZM55-C33
6916	4822 130 10654	BAT254
6918	9322 149 10685	BZM55-C33
6920	9322 149 10685	BZM55-C33
6921	9322 149 10685	BZM55-C33
6922	9322 149 10685	BZM55-C33
6923	9322 149 10685	BZM55-C33
6925	9322 149 10685	BZM55-C33



7900	5322 209 71568	PC74HCT14T
7904	3122 357 00301	Software DCC_7904_00301
7907	3122 357 00311	Softwrae DCC_7907_00311
7910	4822 209 30212	PC74HCT125T
7915	3198 010 42310	BC847BW